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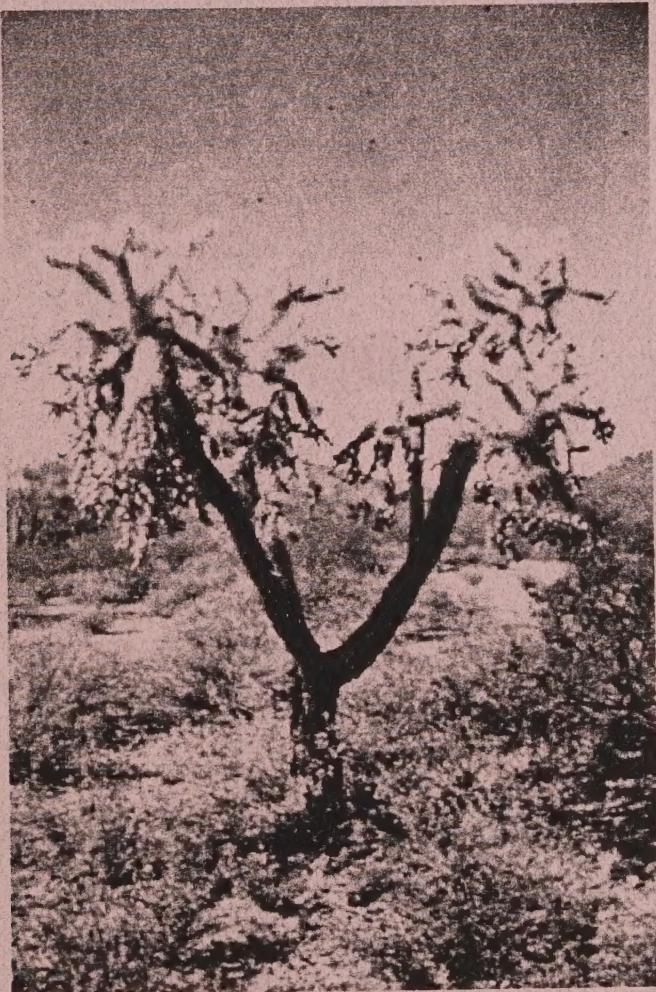
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# Report of the National Pesticide-Use Management Training Course

## March 16 - 30, 1994

### Marana, Arizona



FHTET 96-27  
November 1996

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If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

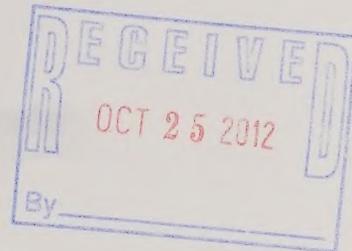
**NOTE:** Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the U.S Environmental Protection Agency, consult your local forest pathologist, county agriculture agent, or State extension specialist to be sure the intended use is still registered.



Cover Photo - computer scan, *Cholla* sp.,  
Organ Pipe National Monument, AZ  
Photo by John Barry  
1994

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Report of the National  
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Prepared by:

John W. Barry

With contributions from:  
Julie Weatherby  
Phil Mocettini  
James Hadfield  
Jim Brown  
Ed Monnig

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USDA Forest Service  
Forest Health Technology  
Enterprise Team  
2121C Second Street  
Davis, CA 95616  
(916) 757-8342  
FAX (916) 757-8383



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- Module II    Incident Command System
- Module III    Common Subjects
- Module IV    Herbicides

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## **Introduction**

This report documents the National Pesticide-Use Management Training Course conducted March 16 - 30, 1994 at the National Advanced Resource Technology Center (NARTC), Marana, AZ. The purpose of this report is to provide a reference source for planning and conducting future pesticide management courses. The NARTC administrative and training process is an outstanding model of how to conduct an intensified training program.

### **Course Goal**

To provide a forum for pesticide-use management information and technology transfer to USDA Forest Service scientists and foresters; and State and Federal cooperators, and international partners.

### **Course Objective**

Upon successful completion of the course, the attendees will be updated on management and practices of forestry-use pesticides to manage forest and range pests.

### **Course Description**

This course is designed to update land management professionals who coordinate, plan and manage pesticide-use projects and activities, on current issues and state-of-the-art methods of safe and effective use of pesticides.

The 1994 course will be divided into four modules of instruction, an Insecticide Module, an Incident Command System Module, a Common Subject Module, and an Herbicide Module. Students may attend one or more modules. Students will be given classroom instruction, and practical and field exercises to enhance and make their learning experiences more interesting. Reference materials covering appropriate pesticides, pesticide application, and environmental monitoring will be provided for the student's retention.

## Module Objectives

### *Module I - Insecticide*

To review and provide students updates on use, types, and developments in forestry use pesticides.

### *Module II - Incident Command System (ICS)*

To introduce students to the ICS system - how to plan, organize, manage, and direct pesticide application projects using ICS.

### *Module III - Common Subject*

To update students on national and international issues on pesticide use and practices to include environmental protection, human health, pesticide equipment, forest health, and ecosystem.

### *Module IV - Herbicide*

To review herbicide use, availability, policy and practices on national forest and range lands.

## Target Group

Pesticide Coordinators from Forest Service Regional Offices, the Northeast Area (NA), and Experiment Stations; others include: silviculturists, hydrologists, range conservationists and IPM specialists; entomologists and pathologists from Forest Pest Management and Research; state cooperators; other federal cooperators from EPA, F&WS, APHIS, NPS, DOD, BLM, and BIA; and international partners from Mexico, Canada, Russia, China, New Zealand, and Australia.

## Instruction

Instruction was provided by scientists (staff and field) from USDA Forest Service, other Federal agencies, States, academia, industry and non-profit organizations. In most cases the USDA Forest Service covered travel

expenses. Instruction was evaluated by the students to be of high quality, meeting the NARTC standards.

### **Student Demographics**

<u>Module</u>	<u>No. Of Students</u>
I	43
II	47
III	46
IV	28
<hr/>	
USFS	31
State	10
Other Federal	8
BIA	(1)
USAF	(2)
FWS	(2)
NPS	(2)
APHIS	(1)
Mexico	3
Russia	2
Canada	1
<hr/>	
Total	55

Compiled from actual attendance records.



## **Summary Critique of the Insecticide Module**

**Julie Weatherby  
Phil Mocettini**



**CRITIQUE OF THE INSECTICIDE MODULE**  
**National Pesticide Use Management Course**  
**March 16-30, 1994**

Summarized by: Julie Weatherby, FPM R4  
Phil Mocettini, FPM R4

The 1994 National Pesticide Use Management Course was divided into 4 modules. The framework was selected by the steering committee in order to allow the students to attend sessions of interest. By so doing the steering committee hoped that the module content could be better targeted to the audience.

The insecticide module was the first module scheduled for Wednesday, March 16 through Friday, March 18 and 1 day on calibration and characterization within the common module. Twenty-five instructors and approximately 40 students participated in the insecticide module. This critique was developed from student comments on the module evaluations and individual class evaluations. Twenty-nine module evaluations and an average of 29 class evaluations per class were completed and are summarized in this critique.

Section 1 summarizes the module evaluations. Questions contained on the module evaluation form are presented along with a short paragraph summarizing frequent responses of the students. Immediately following is a comments section where other constructive comments are listed.

Section 2 summarizes the individual class evaluations. The individual class evaluations lend themselves to some numerical summarization. Each of the 22 classes are summarized separately. Students were asked to rate 4 aspects of each presentation; quality of instruction, use of audiovisuals, quality of material, and value of material. Ratings were done on a 5 point scale. Frequency histograms were developed to display the summarized ratings. In addition, mean ratings, minimum ratings and maximum ratings are listed for each aspect of the presentation. Constructive comments are included.

## **SECTION 1. SUMMARY OF THE INSECTICIDE MODULE EVALUATIONS**

### **MODULE OBJECTIVES**

Question 1. Did the content of this module support the module objective?

All but 1 respondent felt that the content supported the module objective. The most frequently stated suggestion was to emphasize forestry-use insecticides particularly any which are new. A couple of returning students felt that the 1994 course was a significant improvement from the previous course. During the critique of previous courses some students felt that the course was not really advanced. This comment surfaced in 1994 but from only 1 student.

Other noteworthy comments included:

- 1) Spray behavior and physics too detailed.
- 2) Heavy emphasis on beetle pheromone not very useful in eastern situations.
- 3) More case studies to illustrate key points would be helpful.
- 4) EPA portions on reduced toxicity/reduced usage and new labels/labeling were too brief.

Question 2. Did instructors demonstrate how lessons relate to practical situations?

Most students felt that there was a good blend between factual material and practical experience. The majority of the class wanted more practical experiences presented so that they could learn about common problems and ways to solve them.

Other noteworthy comments included:

- 1) Appreciated personal experiences such as John Ghent's hints regarding contracts.
- 2) Safety was continually stressed.
- 3) Several instructors said "I have no experiences with that."
- 4) In general instructors answered question well.
- 5) Need to have more equipment available.
- 6) FSCBG discussion and application to actual situation was good.

Question 3. What topics do you believe should be added, given additional emphasis and/or additional time?

The students want more time on operational case studies, GPS, semiochemicals and weather. During semiochemical discussions they want more time spent on results and implementation. Weather was of interest particularly the "no spray condition." This could be tied closely to modeling to demonstrate why these weather conditions result in a no spray decision.

Other noteworthy comments included:

- 1) More hands on exercises.
- 2) Would like to have seen (in pictures or real time) aircraft and their production capabilities.

- 3) More on modes of action.
- 4) Strengthen the ecosystem management panel.
- 5) More discussion time.
- 6) More on contracts for pesticide projects.

Question 4. What should be deleted?

Some of the students found it difficult to relate the spray behavior and physics sessions to field operations. Because of this they felt it was too detailed and not practical. In addition, some students felt that the pheromone sessions were basically summary information and somewhat redundant.

Other noteworthy comments included:

- 1) Delete classification of insecticides.
- 2) Delete EPA discussion of labeling, etc.
- 3) Delete history of use session.
- 4) Drift detection discussion was too long.
- 5) Shorten GPS session.
- 6) Move case studies later in course.

Question 5. What module materials do you believe should be available for reading prior to attending the module?

The students' comments ranged from "don't bother, most won't read them" to "the entire notebook." One student commented that the recommended prereading assignment was outdated and probably shouldn't be recommended.

Other noteworthy comments included:

- 1) Any material on theory.
- 2) List of references for section on pesticide labels.
- 3) A review of spray pattern characterization.
- 4) Physics and spray behavior.
- 5) HAZMAT regulations.
- 6) FAA relative regulations.
- 7) Introduction to class, properties and modes of actions.
- 8) Sample contracts/safety plans.
- 9) Run down on which insecticides control which pests.

Question 6. What other recommendations would you make regarding module content to enable us to better serve the needs of agency administrators and/or the students?

The timing of the course was somewhat inconvenient for students involved in eastern gypsy moth projects. A late January or February date was suggested. In order for the notebook to serve as a reference book, some instructors need to provide more detailed outlines including suggested reading lists. Many students commented that they would like to see more information on risk, worker protection, monitoring ground water and other items which were covered

in the common module. One student commented that perhaps we could consolidate critiques to eliminated duplication.

## FACULTY, FACILITIES, AND ADMINISTRATION

Question 1. Did the faculty provide sufficient assistance to you throughout the module?

All but 1 student felt that the faculty provided sufficient assistance. A few students commented that a few faculty members did not have a good command of the subject or little experience in forestry related pesticide uses. On average the class felt that the faculty was excellent.

Other noteworthy comments included:

- 1) Have everyone stay at Pinal Air Park. Provide single accommodations for those desiring single rooms and provide transportation into town in the evenings.
- 2) All faculty members should have biographical sketches in notebook.

Question 2. What do you believe are one or two most important advantages in conducting this module at NARTC? One or two most important disadvantages?

Advantages:

- 1) Excellent facility for instruction.
- 2) Excellent audiovisual equipment.
- 3) Access to DG system and FTS lines.
- 4) Good organization of materials and notebooks.
- 5) Good weather.
- 6) A chance to see a different part of the country.
- 7) Affordable especially if you stay at Pinal Air Park.
- 8) Option of staying in town or at the Air Park is a plus.
- 9) No significant disadvantages.

Disadvantages:

- 1) No real trees.
- 2) Lodging and food at the Air Park sort of OK.
- 3) Limited lunch options.
- 4) Expensive to travel from the east.
- 5) If everyone doesn't stay at the Air Park there is a missed opportunity for exchange.
- 6) Rooms and food in Tucson expensive for single use.
- 7) Lack of in-room long distance phone calls at the Air Park.
- 8) Too little time outdoors.
- 9) Tone down the AC.
- 10) Timing of course corresponds with budget finalization and GM planning and contracting.

In sum, do you feel the advantages outweigh the disadvantages?

100 % of the class felt that the advantages outweigh the disadvantages.

## SUMMARY

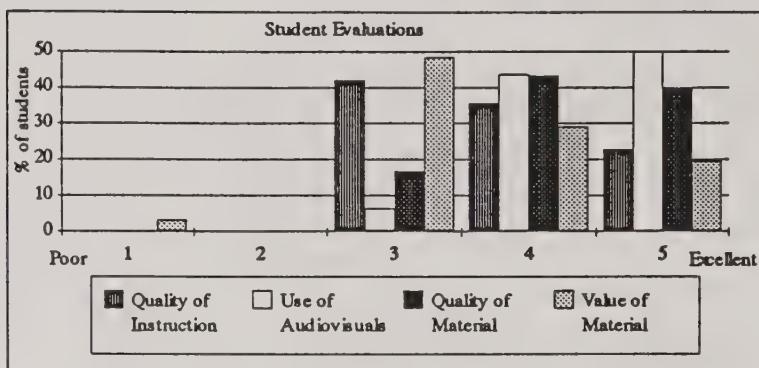
On a scale of 1 - 10 with 1 being a poor rating and 10 an excellent rating, the average class rating for the insecticide module was 8.19.

Noteworthy comment included:

- 1) Impressed by skill of lecturers and quality of illustrations.
- 2) Great improvement from last course.
- 3) Refreshing to see student input used in the development of latest course.
- 4) Hope to be able to send at least 2 people per year for next 2 - 3 years to this type of training.
- 5) Good to break course into modules.
- 6) Suggest using more interactive group assignments.
- 7) Emphasize practical information - I came to learn how to conduct aerial spray projects for gypsy moth and to gain as much knowledge as possible.
- 8) Good representation from private, state and federal employees.
- 9) Suggest 45 minute classes with 15 minute breaks to increase student/teacher interface time.
- 10) Numbering pages in notebook would be helpful.

## SECTION 2. SUMMARY OF INDIVIDUAL CLASS EVALUATIONS

### I-A: History of Insecticide use in North American Forestry

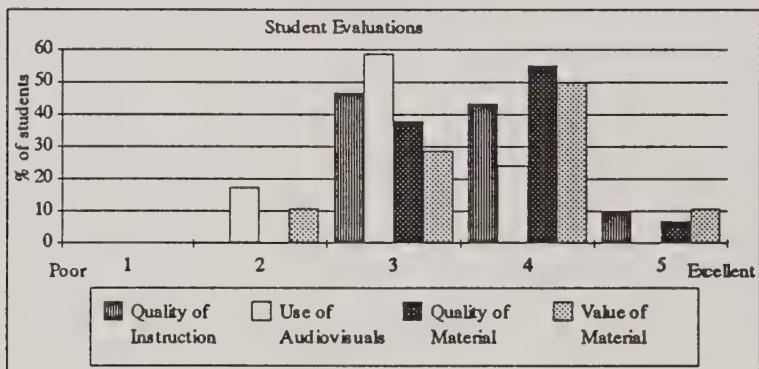


	Quality of Instruction	Use of Audiovisuals
Mean	3.81	4.44
Minimum	3	3
Maximum	5	5
Quality of Material Presented	4.23	3.61
Mean	4.23	3.61
Minimum	3	1
Maximum	5	5

#### Comments:

- 1) Good topic for starting the module.
- 2) Include more of history on development of spray technology.
- 3) Don't read the talk.
- 4) Provide a list of references in handbook.

### I-B: Role of Insecticide use in Ecosystem Management

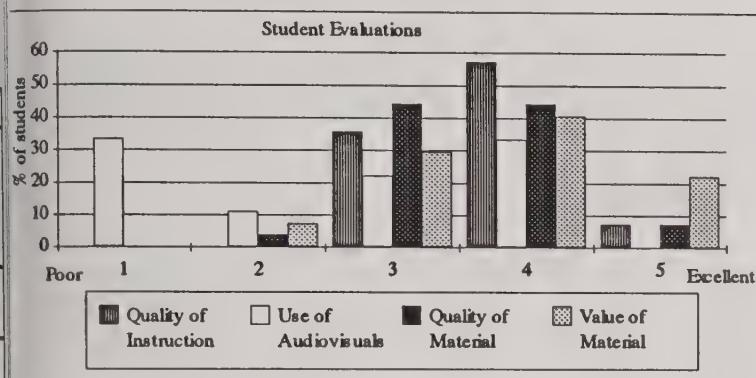


	Quality of Instruction	Use of Audiovisuals
Mean	3.63	3.07
Minimum	3	2
Maximum	5	4
Quality of Material Presented	3.69	3.61
Mean	3.69	3.61
Minimum	3	2
Maximum	5	5

#### Comments:

- 1) Be sure visuals are readable from back of room.
- 2) Leave more time for questions and answers.
- 3) Good perspective across 3 ownership groups
- 4) Need more time.
- 5) Give 15 minutes for each speaker then allow 45 minutes for them to discuss various scenarios proposed by moderator.
- 6) Have each presenter stand during his presentation.
- 7) Speakers should represent a greater geographical area.

## I-C1: New Directions in Pesticide Usage

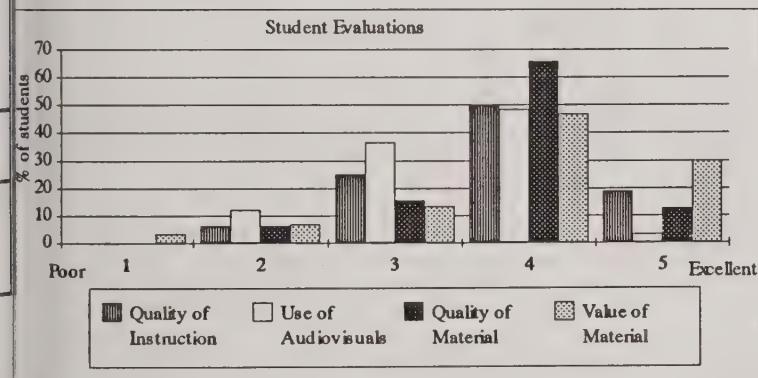


	Quality of Instruction	Use of Audiovisuals
Mean	3.71	2.56
Minimum	3	1
Maximum	5	4
	Quality of Material Presented	Value of Material to Student
Mean	3.56	3.78
Minimum	2	2
Maximum	5	5

Comments:

- 1) Allow more time for this topic.
- 2) Topic is very timely.
- 3) Add visuals.
- 4) Handouts were very beneficial.

## I-C2: Insecticide Classification, Modes of Action and Properties

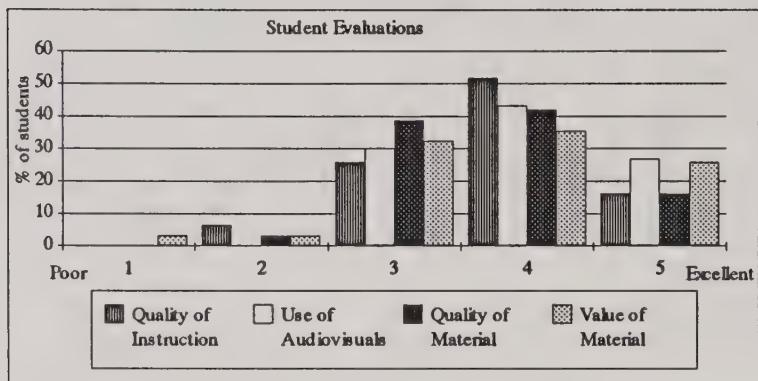


	Quality of Instruction	Use of Audiovisuals
Mean	3.81	3.42
Minimum	2	2
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	3.84	3.93
Minimum	2	1
Maximum	5	5

Comments:

- 1) Spend more time on microbials, IGRs, etc.
- 2) Too much to cover in allotted time.
- 3) Visuals not readable and many were not included in notebook.
- 4) Good review.
- 5) Too complicated.

### I-C3: Pesticide Labels and Labeling

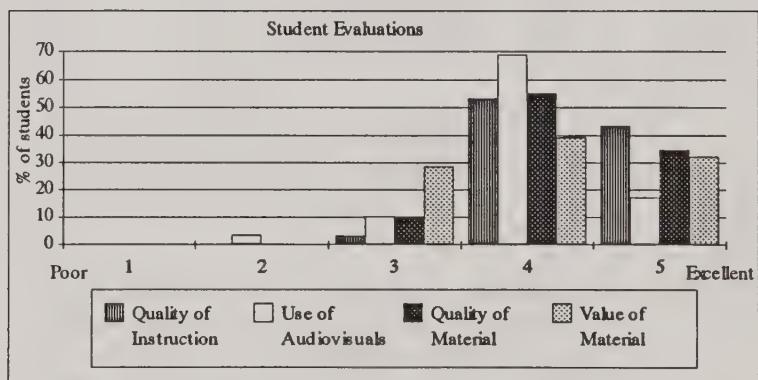


	Quality of Instruction	Use of Audiovisuals
Mean	3.77	3.97
Minimum	2	3
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	3.71	3.77
Minimum	2	1
Maximum	5	5

Comments:

- 1) Need to allot more time.
- 2) Many visuals were too small to see.
- 3) Very knowledgeable.
- 4) Good handouts.

### I-D: Adjuvants Used with Chemical and/or Biological Insecticides

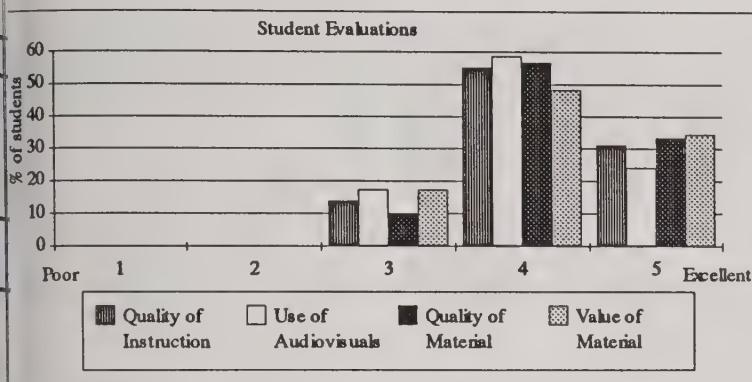


	Quality of Instruction	Use of Audiovisuals
Mean	4.40	4.00
Minimum	3	2
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.24	4.04
Minimum	3	3
Maximum	5	5

Comments:

- 1) Excellent sense of humor.
- 2) Use examples of products that work.
- 3) Speaker was very enthusiastic.
- 4) Provide more handout information.
- 5) Information seemed more related to herbicide applications.
- 6) Appreciated the honest assessment of the effectiveness of adjuvants.

## I-E: Semiochemicals

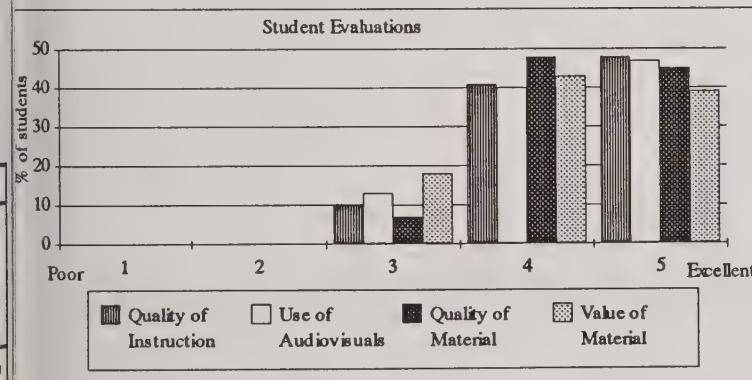


	Quality of Instruction	Use of Audiovisuals
Mean	4.17	4.07
Minimum	3	3
Maximum	5	5
Quality of Material Presented	Value of Material to Student	
		4.23
		4.17
Mean	3	3
Minimum	5	5
Maximum		

Comments:

- 1) Definitely keep this session in training.
- 2) Good slides.
- 3) Speaker is very knowledgeable.
- 4) Good sense of humor.

## I-F: Semiochemical Strategies

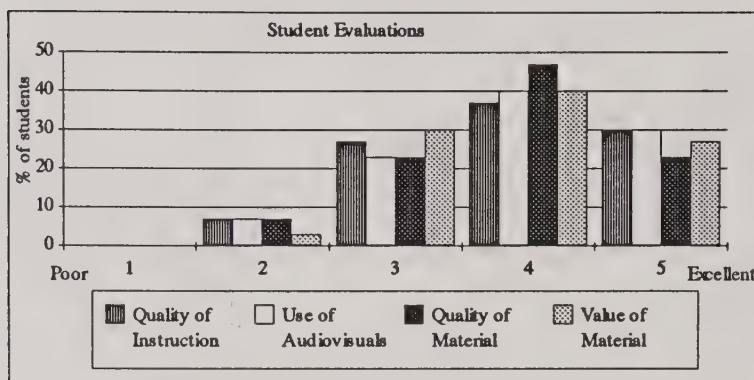


	Quality of Instruction	Use of Audiovisuals
Mean	4.38	4.33
Minimum	3	3
Maximum	5	5
Quality of Material Presented	Value of Material to Student	
		4.38
		4.21
Mean	3	3
Minimum	5	5
Maximum		

Comments:

- 1) Continue to offer this session in future and maybe expand it.
- 2) Don't do overheads in all capitals. It is too hard to read.
- 3) Don't stand in front of overhead screen.
- 4) Too much overlap and duplication.
- 5) Good session.

## I-G: Spray Behavior, Physics and Modeling

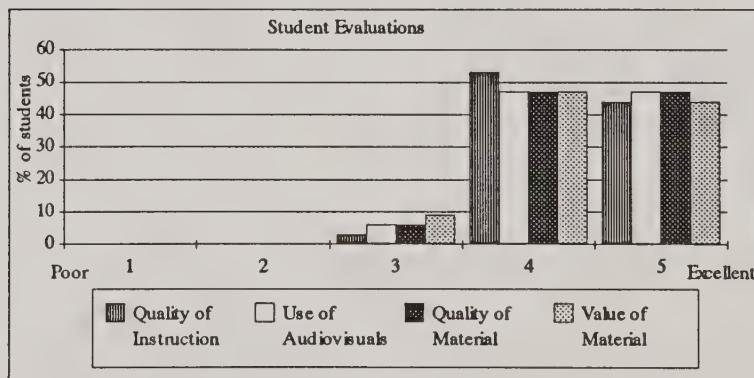


	Quality of Instruction	Use of Audiovisuals
Mean	3.90	3.93
Minimum	2	2
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	3.87	3.90
Minimum	2	2
Maximum	5	5

Comments:

- 1) Include handouts on FSCBG.
- 2) Strengthen application of spray behavior in operational use discussion.
- 3) Spray droplet distribution exercise not very useful.
- 4) Too technical.
- 5) Case studies unclear and confusing.
- 6) Need more time on practical meteorology.
- 7) Need more visual aids, include as handouts.
- 8) Discussion of models and modeling was very beneficial.
- 9) Explain why this information is important to workers on a spray project.

## I-H: Insecticide Operational Case Studies

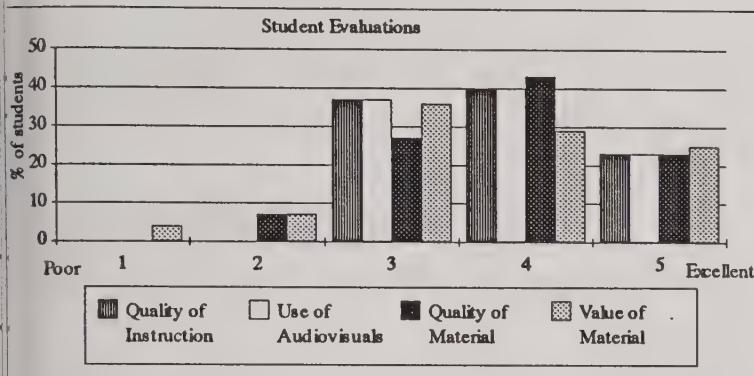


	Quality of Instruction	Use of Audiovisuals
Mean	4.41	4.41
Minimum	3	3
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.41	4.34
Minimum	3	3
Maximum	5	5

Comments:

- 1) Excellent session.
- 2) Need to allot more time to this topic.
- 3) Excellent visual aids.
- 4) Very practical for those involved in a spray project.

## I-I: Hand-held and Ground Equipment

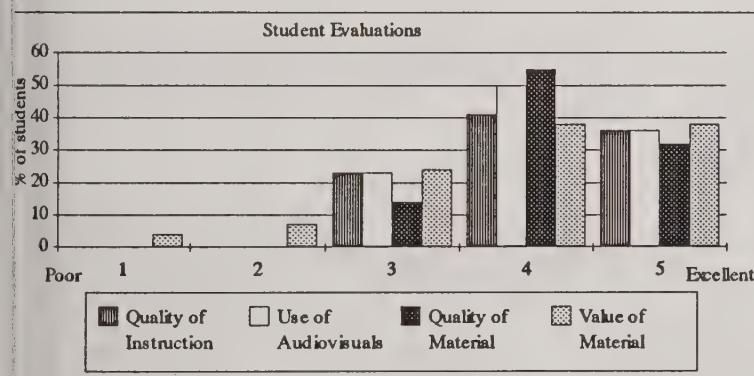


	Quality of Instruction	Use of Audiovisuals
Mean	3.87	3.87
Minimum	3	3
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	3.83	3.64
Minimum	2	1
Maximum	5	5

Comments:

- 1) Include discussion of new backpack sprayers with a canister that fits into the pack.
- 2) Use demonstration equipment.
- 3) Make written lesson plan more complete.
- 4) Include calibration of hand held equipment.
- 5) Some of the slides were underexposed.
- 6) Good review of information most of us have been exposed to.

## I-J: Spray Aircraft

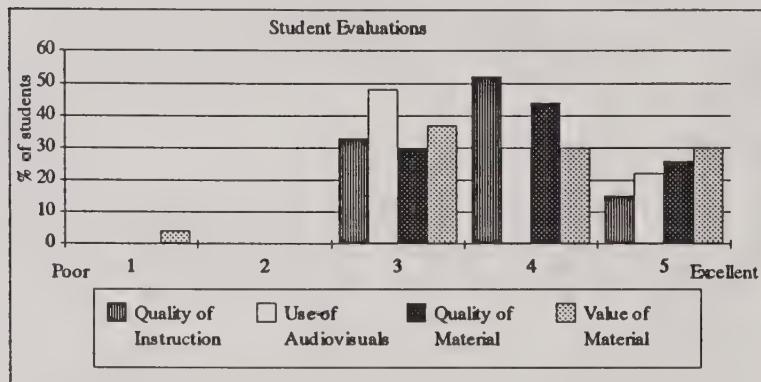


	Quality of Instruction	Use of Audiovisuals
Mean	4.14	4.05
Minimum	3	3
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.18	4.14
Minimum	3	3
Maximum	5	5

Comments:

- 1) Provide lesson plan for student notebooks.
- 2) Good discussion of practical safety around aircraft.
- 3) It would have been helpful to have an aircraft at the course.

## I-K: General Configuration of a Spray System

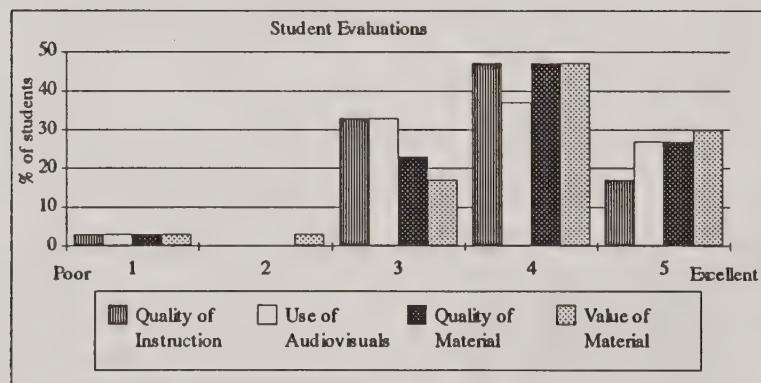


	Quality of Instruction	Use of Audiovisuals
Mean	3.81	3.74
Minimum	3	3
Maximum	5	5
Quality of Material Presented	3.96	3.81
Mean	3.96	3.81
Minimum	3	1
Maximum	5	5

Comments:

- 1) Hands on approach very good.
- 2) Need more application to forest applications.
- 3) Too rushed.
- 4) Include diagrams in notebook.
- 5) Assumed we knew too much.
- 6) It was good to have the DOT truck at the session.
- 7) Use larger type on diagrams.

## I-L: Nozzles - Hydraulic

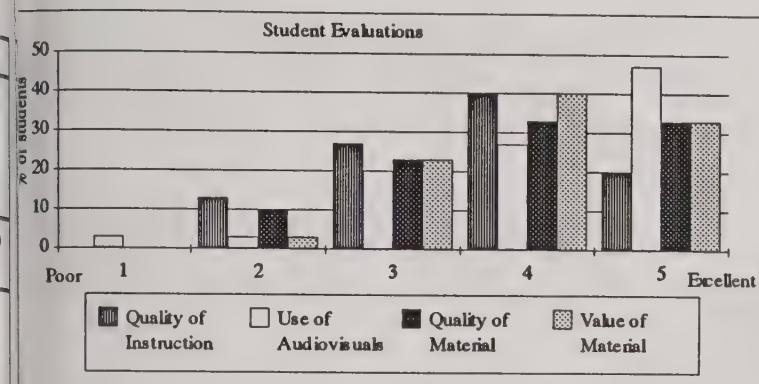


	Quality of Instruction	Use of Audiovisuals
Mean	3.73	3.83
Minimum	1	1
Maximum	5	5
Quality of Material Presented	3.93	3.97
Mean	3.93	3.97
Minimum	1	1
Maximum	5	5

Comments:

- 1) Good hands on exercises.
- 2) Too fast.
- 3) Assumed the class knew too much.
- 4) For demonstrations, use a T bar pipe with several nozzle bodies and different nozzles to compare spray patterns.
- 5) Explain what different nozzles are used for.

## I-M: Nozzles - Rotary Atomizers

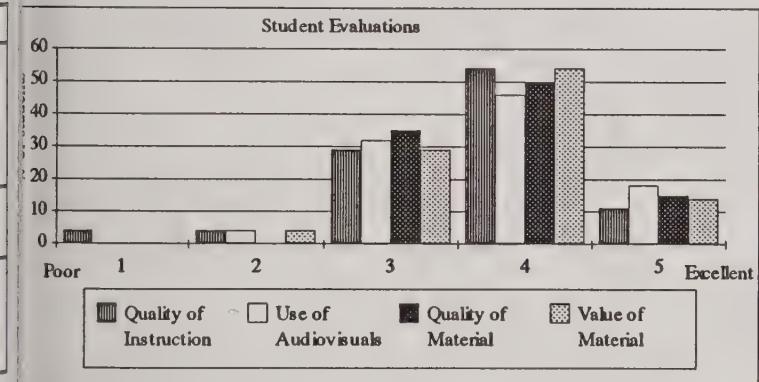


	Quality of Instruction	Use of Audiovisuals
Mean	3.67	4.10
Minimum	2	1
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	3.90	4.03
Minimum	2	2
Maximum	5	5

Comments:

- 1) Good introduction.
- 2) Demonstration nozzles were very helpful.
- 3) Instructor should have more practical experience with equipment.
- 4) Good comments from other faculty attending lecture.
- 5) Speaks too fast.
- 6) Punch holes in handouts.

## I-N: Pumps

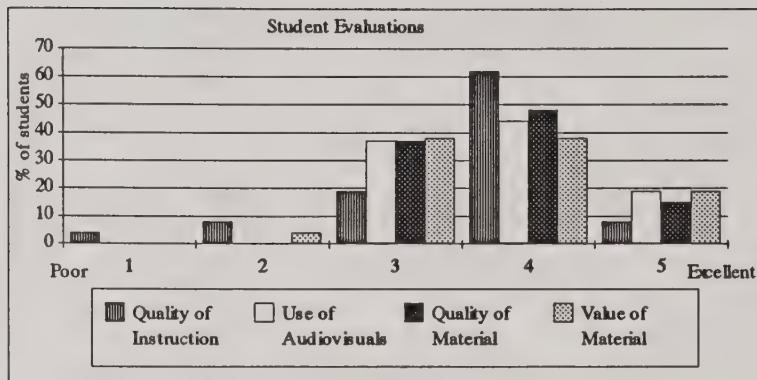


	Quality of Instruction	Use of Audiovisuals
Mean	3.64	3.79
Minimum	1	2
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	3.81	3.79
Minimum	3	2
Maximum	5	5

Comments:

- 1) Slow down, too much info for allotted time.
- 2) Do not read material
- 3) Include pump diagrams in handouts.
- 4) Hands on exercises were good.
- 5) Have someone at each station to explain how each type of pump works.
- 6) Explain how the students might use this information.

## I-O: Filters and Booms

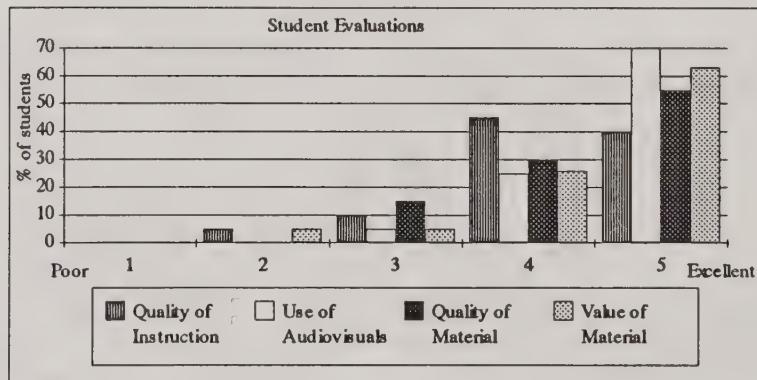


	Quality of Instruction	Use of Audiovisuals
Mean	3.62	3.81
	1	3
	5	5
	Quality of Material Presented	Value of Material to Student
Mean	3.78	3.73
	3	2
	5	5

Comments:

- 1) Slow down, much too fast.
- 2) Don't read lesson.
- 3) Include more information in handout.
- 4) Use visualizer to show pieces of equipment.
- 5) Hand on examples were helpful.
- 6) What is the best combination of all this equipment for spraying various formulations?

## I-P: Misc. Equipment

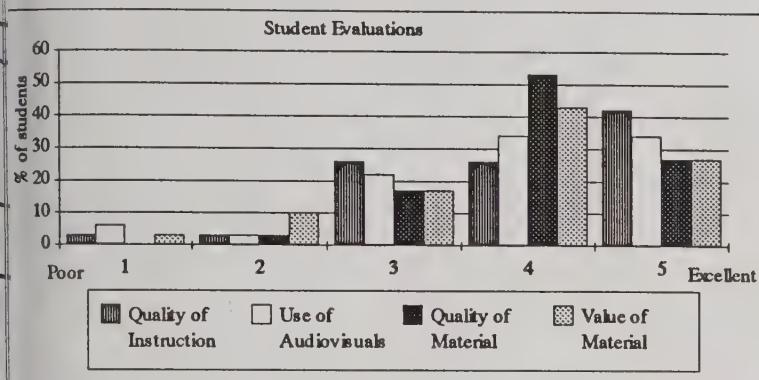


	Quality of Instruction	Use of Audiovisuals
Mean	4.20	4.65
	2	3
	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.45	4.47
	3	2
	5	5

Comments:

1. Very popular with the students.

## I-Q: Pheromone Application Equipment



	Quality of Instruction	Use of Audiovisuals
Mean	4.00	3.88
Minimum	1	1
Maximum	5	5

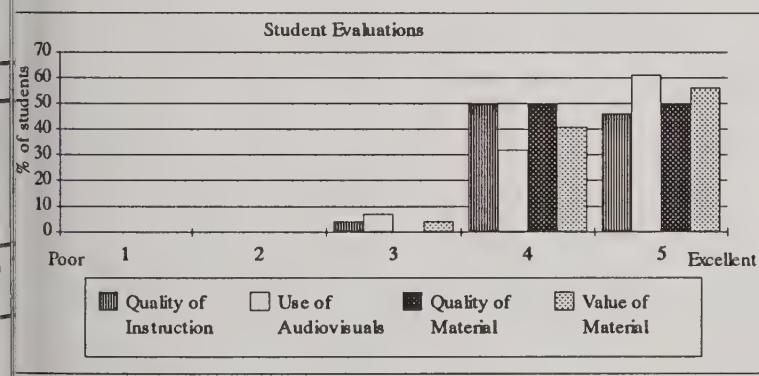
  

	Quality of Material Presented	Value of Material to Student
Mean	4.03	3.80
Minimum	2	1
Maximum	5	5

Comments:

- 1) Presentation was a bit rushed.
- 2) It was great to have all of the examples.
- 3) Great sense of humor.
- 4) Good class interaction.
- 5) Give examples of survey designs for each pest and the type of traps used.
- 6) Tie to results of aerial application projects for mating disruption, etc.
- 7) Keep this topic in the course.
- 8) Talk to audience, don't mumble.
- 9) Great way to start the day.

## III-N: Calibration Procedures



	Quality of Instruction	Use of Audiovisuals
Mean	4.43	4.54
Minimum	3	3
Maximum	5	5

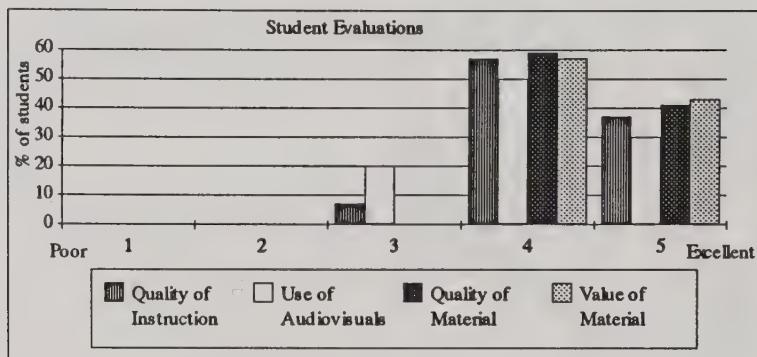
  

	Quality of Material Presented	Value of Material to Student
Mean	4.50	4.52
Minimum	4	3
Maximum	5	5

Comments:

- 1) Define more parameters in practical exercises.
- 2) Suggested problem - An aircraft arrives at project.  
Can it meet the application specifications?
- 3) Install pressure gauges on boom.
- 4) Liked the calibrator.
- 5) Good outdoor exercises.
- 6) Had plenty of time to finish calibration problems.
- 7) Needed more time
- 8) Incorporate pellet or granule calibration.

### III-Q: Characterization Procedures

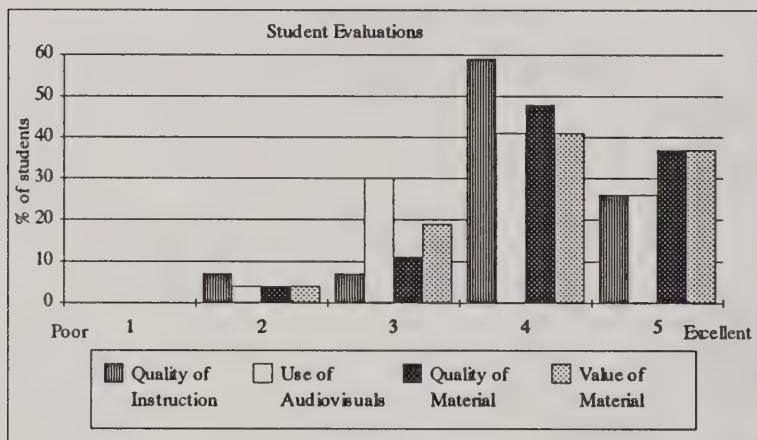


	Quality of Instruction	Use of Audiovisuals
Mean	4.30	4.10
Minimum	3	3
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.41	4.43
Minimum	4	4
Maximum	5	5

Comments:

- 1) Suggest using slides of operational procedures.
- 2) Need more time to complete exercises.
- 3) Good responses to questions.
- 4) Good exercises.
- 5) How do you use the characterization results to modify spraying configuration?

### III-R: Swath Kit Exercises



	Quality of Instruction	Use of Audiovisuals
Mean	4.04	3.89
Minimum	2	2
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.19	4.11
Minimum	2	2
Maximum	5	5

Comments:

- Comments included under session III-Q: Characterization Procedures.

# Summary Critique of the Incident Command System Module

James Hadfield



CRITIQUE OF THE INCIDENT COMMAND SYSTEM MODULE  
National Pesticide Use Management Course  
March 21, 1994

Prepared by James Hadfield, R6 FPM

A module on using the Incident Command System for pesticide application projects was presented for the first time at the National Pesticide Use Management Course. The course steering committee made a decision to include information on ICS because it is increasingly being used to plan and manage such projects, and there is growing support to using ICS as a standardized system for managing these projects regardless of where they take place.

Approximately 50 students participated in the ICS module. The majority had participated in the Insecticide Module. A small, but significant number had signed up for the Common Module and the Herbicide Module, so there appeared to be interest in the ICS module from both the insecticide and herbicide students.

Four instructors were used in the ICS module.

A statistical analysis of the individual class and module evaluations was not deemed necessary. The critique of the insecticide module provides an excellent analysis of the students views of NARTC facilities and course administration.

Overall the students rated the ICS module quite favorably, but it did not get an outstanding rating.

Question 1. Did the content of this module support the module objective?

Most responders said it did. A small number expected to come away knowing how to use ICS to manage their projects. This was not a module objective. A small number of students indicated the material was too complicated. I felt the major objectives were to introduce ICS to the class and show how it is a system that can be used to effectively manage a wide variety of pesticide application projects and many other activities natural resource agencies get involved with.

Question 2. Did instructors demonstrate how lessons relate to practical situations?

Again most responders said they did, but in my view the average response seemed somewhat less enthusiastic than the responses to Question 1. There were several comments that the instructors should have tried to interact more with the students. Most of the module consisted of lectures that in the instructors opinions didn't seem to provide much opportunity for class interaction. Nevertheless there is undoubtedly some room to improve. There were some comments specifically indicating the instructors really knew their material and had practiced what they were preaching. A somewhat extemporaneous part of the module involved having three of the students make brief presentations of how they were using ICS to manage their projects. This received several positive comments for the students.

Question 3. What topics do you believe should be added, given additional emphasis and/or additional time?

There was not a clamor for additional topics. The most common request for additional material was for case histories or actual examples of projects run using ICS.

Question 4. What should be deleted?

Several students responded that there was too much repetition of material. I felt this was the area needing the most improvement at the end of the day. We repeated some of the material 3 times. Some students indicated the introduction to the module was too long and should be pared back.

Question 5. What module materials do you believe should be available for reading prior to attending the module?

Most students response is don't bother and I wholeheartedly agree! However, I feel we could have done a better job of providing take-home materials on ICS in the course notebook. The new ICS management curriculum that is scheduled to come on line in October 1994 would be an excellent source of references because it covers ICS from a generic management system perspective, not from the perspective of wildlnad fire suppression.

Question 6. What other recommendations would you make regarding module content to enable us to better serve the needs of agency administrators and/or the students?

Provide more case studies. The class exercise of developing an ICS organization for a rather complex pesticide application incident was well received, however some students felt a less complicated project should have been added.

Module Leader's comments: As previously stated I felt we repeated material too much. This problem can be lessened to some extent by even greater coordination between the instructors during lesson preparation and finalization. The ICS experience level of the students varied tremendously. Some had taken several fire oriented ICS courses and were Red Carded, others had no previous training in ICS, and some undoubtedly had varying degrees of misinformation about ICS. I feel there will probably always be that level of discrepancy in a group that large but the module was directed towards those with no previous training. I felt that Terry Haney did an outstanding job in his presentation on introducing generic ICS to the class. Too much time was spent covering in detail responsibilities of specific positions in ICS pesticide application projects. This material can be provided in the course notebook.

One entire day is probably too much time to spend on ICS for the course. However, I believe that the module should be expanded to at least a day and a half and be broadened beyond ICS to include the steps and actions need to organize and carry out these kind of projects. The students should be given presentations on contract preparation, award , and administration. This would get into contract specifications and project design. I feel one of the weaknesses of the course is inadequate coverage of moving from a Record of Decision to apply pesticides to organizing to carry out such decisions. The students traditionally have been provided with a wealth of information on

technical aspects of pesticide application but have been underexposed in how to organize that information to carry out the projects.

For students interested in using ICS to manage pesticide application projects, they need to sign up for the Basic ICS I-200.



## Summary Critique of the Common Subjects Module

Jim Brown



MAR 14 1995

**CRITIQUE OF THE COMMON SUBJECTS MODULE**  
National Pesticide Use Management Course  
March 16-30, 1994

Summarized by: Jim Brown, FH, R-8

The 1994 National Pesticide Use Management Course was divided into four modules. This critique applies to the Module III, "Common Subjects," which was presented March 22-25. Three of the classes, however (III-N, III-Q and III-R) were actually parts of the Insecticide Module, and are also included in that module's critique.

Twenty instructors (including those in classes III-N, III-Q, and III-R) participated in the module, and presentations were also made by two visiting participants from Russia. Approximately 40 students participated in this module. This critique was developed from student comments on the module evaluations and individual class evaluations. Twenty-three module evaluations and an average of twenty-nine class evaluations per class were completed, and are summarized in this critique.

Section 1 summarizes the module evaluations. Questions contained on the module evaluation form are presented, along with a short paragraph summarizing frequent responses from the students. Immediately following is a comments section where other constructive comments are listed.

Section 2 summarizes the individual class evaluations, which lend themselves to numerical summarization. Each of the 21 classes are summarized separately. Students were asked to rate four aspects of each presentation (quality of instruction; use of audiovisuals; quality of material; and value of material) on a five-point scale. Frequency histograms were developed to display the summarized ratings. In addition, mean ratings, minimum ratings, and maximum ratings are listed for each aspect of the presentation. Constructive comments are included. One comment summary was received which appeared to combine two class segments (III-Q and III-R); as other separate evaluations were available for these classes, this summary was not included in the critique.

## SECTION 1. SUMMARY OF THE GENERAL SUBJECTS MODULE EVALUATIONS

### MODULE OBJECTIVES

Question 1. Did the content of this module support the module objectives?

Of twenty-three respondents, nineteen felt that the content supported module objectives. Three felt that objectives were marginally or conditionally met, and one felt that content did not support objectives.

Other noteworthy comments included:

- 1) Some of the material fell short of updating - was quite dated.
- 2) Calibration procedures covered well / swath kit demonstration not fulfilled / NEPA/risk assessment well covered / safety issues well covered / unknown as to the objectives of "Good Laboratory Practices."
- 3) Sessions on NEPA, risk assessment, and worker protection were very helpful.
- 4) Introduced all subjects to at least an introductory level as well as hazards of noncomplete knowledge.
- 5) As someone from outside the U.S., I would have liked to hear more about social/political, environmental effects not just as they relate to the EA process but discussed in more generic terms.

Question 2. Did instructors demonstrate how lessons relate to practical situations?

Seventeen of twenty-three respondents answered "yes;" six responded "some," "usually," "not always," or "not well."

Other noteworthy comments include:

- 1) More real-situation exercises would have been more effective.
- 2) Social analysis was confusing- i.e. read to us but never know its significance to field.
- 3) Swath kit really needed to be demonstrated.
- 4) Calibration exercise was good, except it would probably be good to pretend the contractor comes on site and have the students fix any problems.
- 5) Overall yes, except the lab practices.
- 6) Good personal experiences.
- 7) Perhaps examples/case studies for more units.

Question 3. What topics do you believe should be added, given additional emphasis and/or additional time?

Risk communication was the most prominent topic for greater emphasis; many students wanted this topic expanded so that the entire video program could be viewed. Several also wanted more information on water or watershed issues including monitoring, buffer zones, and effects on non-target organisms. Repeated requests were made for a session on contract writing and layout, and for more NEPA instruction. Several students wanted more field, or "hands-on," exercises.

Other noteworthy comments included:

- 1) Bringing in a helicopter and airplane, setting them up for a spray project, calibrating, running a card line and swath kit analysis would be good.
- 2) Integrated pest management; public involvement and education.
- 3) A section on which pesticides are in use, and their true effectiveness; pros and cons of using a specific pesticide.
- 4) More time for calibration, characterization, swath kit.
- 5) More emphasis on insecticides to balance what this time was an overemphasis on herbicides. More social events to interact w/other students. Add some information on ecosystems.
- 6) More practical lessons for field personnel.

Question 4. What should be deleted?

About 25% of the students thought the Good Laboratory Practices presentation should be shortened or eliminated. The only other topics which received multiple responses for elimination were Social/Political Analysis and Sampling Spray Drift.

Other noteworthy comments included:

- 1) New Zealand herbicides; replace EPA T&E species talk with a F&WS presentation.
- 2) III-I Safety Equipment should be shortened.
- 3) The field trip was not very productive.
- 4) Compliance with various [U.S.] acts - although this is just the perspective of 1 Canadian.
- 5) Some things in the Common Module that apply more to herbicides rather than for someone in forest entomology who contracts for aerial spraying on occasion.

Question 5. What module materials do you believe should be available for reading prior to attending the module?

Nineteen of the twenty-three respondents either did not answer this question, or answered "none," or words to that effect.

Other noteworthy comments included:

- 1) Make "outrage" tape available.
- 2) Probably wouldn't have time to read them at this time of the year.
- 3) Calibration/characterization.
- 4) Maybe a general publication of the basics for those who are new to this area.

Question 6. What other recommendations would you make regarding module content to enable us to better serve the needs of agency administrators and/or the students?

Eighteen of the twenty-three respondents either did not answer this question, or answered "none," or words to that effect.

Other noteworthy comments included:

- 1) Equipment demonstrations are good.
- 2) More time.
- 3) Discuss National pesticide use & issues!!!!
- 4) Reschedule for some earlier or later time that wouldn't overlap with preparations for eastern gypsy moth suppression projects. Insist on equal time for insecticides.
- 5) More example documents - would have liked to see an "ideal" BE.

#### FACULTY, FACILITIES, AND ADMINISTRATION

Question 1. Did the facility provide sufficient assistance to you throughout the module?

Twenty-one of twenty-three respondents either did not answer this question, or answered "yes;" a few added superlatives.

Other noteworthy comments included:

- 1) Faculty [illegible word] would have been better if everyone had stayed here. Evening programs/social activities would have been nice.
- 2) Not enough time to visit. All students and faculty should have been housed at Pinal Air Park. It was detrimental to course objectives to have personnel staying downtown, as well as a waste of government funds.

Question 2. What do you believe are one or two most important advantages in conducting this module at NARTC? One or two most important disadvantages?

Six respondents did not answer this question; of the remainder, fifteen responses were positive, while two were negative.

Other noteworthy comments included:

- 1) Advantages - nation wide expert.
- 2) Would like to see all participants in one location, either Marana or Tucson
- 3) Advantages: Facility; weather; access to DGs; Disadvantages: Airfare expense.
- 4) Advantages - staff assistance to instructors & students, excellent facility & equipment.
- 5) Great location! Aircraft field trip - no outside interferences.
- 6) Great audio visual facilities. Disadv: air conditioning was mostly too cold (i.e., when people take off their coats to go outside, it is time to take notice.)
- 7) Really nice facility - whole meeting was very efficient.
- 8) Charles McMahon [two responses, clearly as an advantage].
- 9) Disadvantage - lack of access to good field forestry site.
- 10) Too far from station, expensive to fly here.
- 11) Tucson has limited commercial airline access and is not very centrally located for students. (Remember, field stations usually have little discretionary travel funds in relation to ROs and the WO). Also, too cold.

In sum, do you feel that the advantages outweigh the disadvantages?

Three of twenty-three respondents did not answer this question; eighteen responded "yes," two "no."

#### SUMMARY

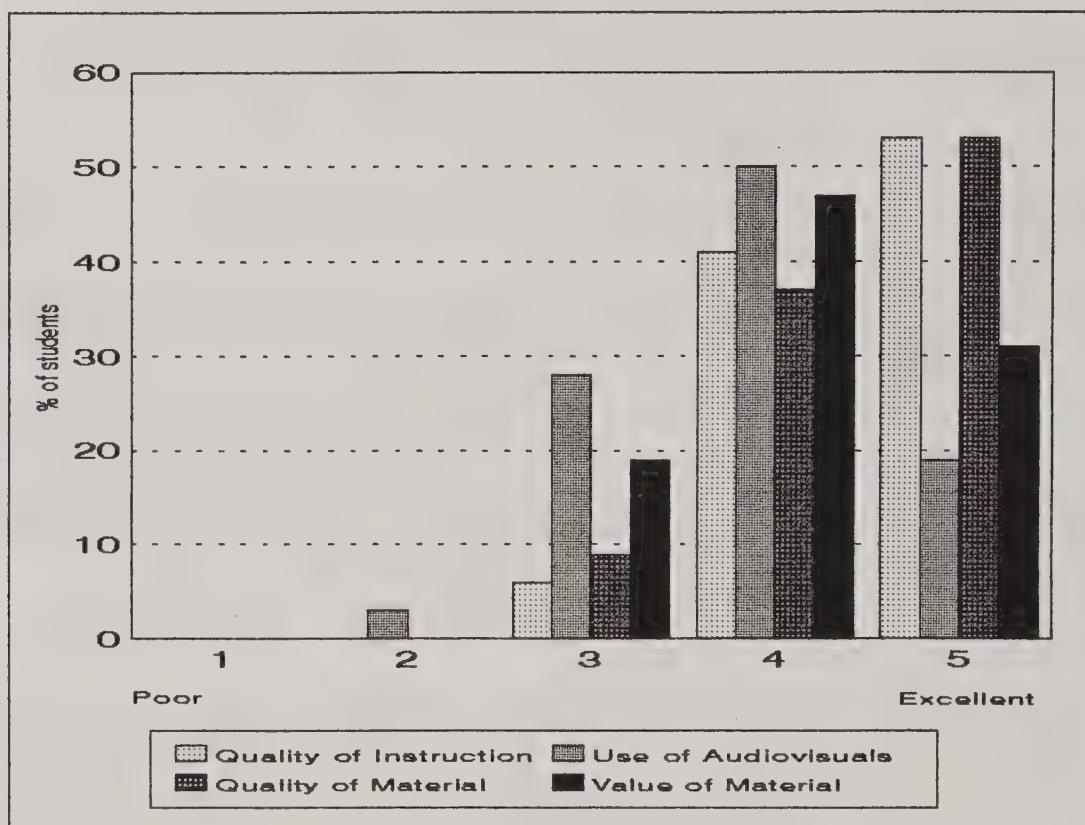
On a scale of 1-10 with 1 being a poor rating and 10 an excellent rating, the average rating for the Common Subjects module was 7.58.

Noteworthy comments includued:

- 1) Although I'm not a FS employee, I found about 75% of the module of direct interest to me.
- 2) The notebooks were great. All the information was well organized and in a place where it can be referenced. The speakers were professionals in the field and experts on the topics they discussed.
- 3) I think it would be better if everyone stayed for the entire course rather than a module by module approach. If you are going to run separate modules, run them at separate times as completely separate courses.
- 4) In general, most speakers used entire speaking time and no time for questions. Should have field trip each Friday afternoon. Also let out early (3-4:00) one afternoon. Room too cold!
- 5) Turn the A.C. down, its been too cold.
- 6) Outstanding presentations by Knapp/McConnell; Kathie Hauser; Charles McMahon; Larry Wong; John Taylor.
- 7) This seemed to be a module for instructors where they could discuss their area of expertise, not a module that related National pesticide use and issues. You need to get instructors that have better presentation capability; many has distracting mannerisms that hurt concentration; many were monotonic. I would suggest going outside the USFS for speakers.

## SECTION 2. SUMMARY OF INDIVIDUAL CLASS EVALUATIONS

### III-A: NEPA and Public Involvement

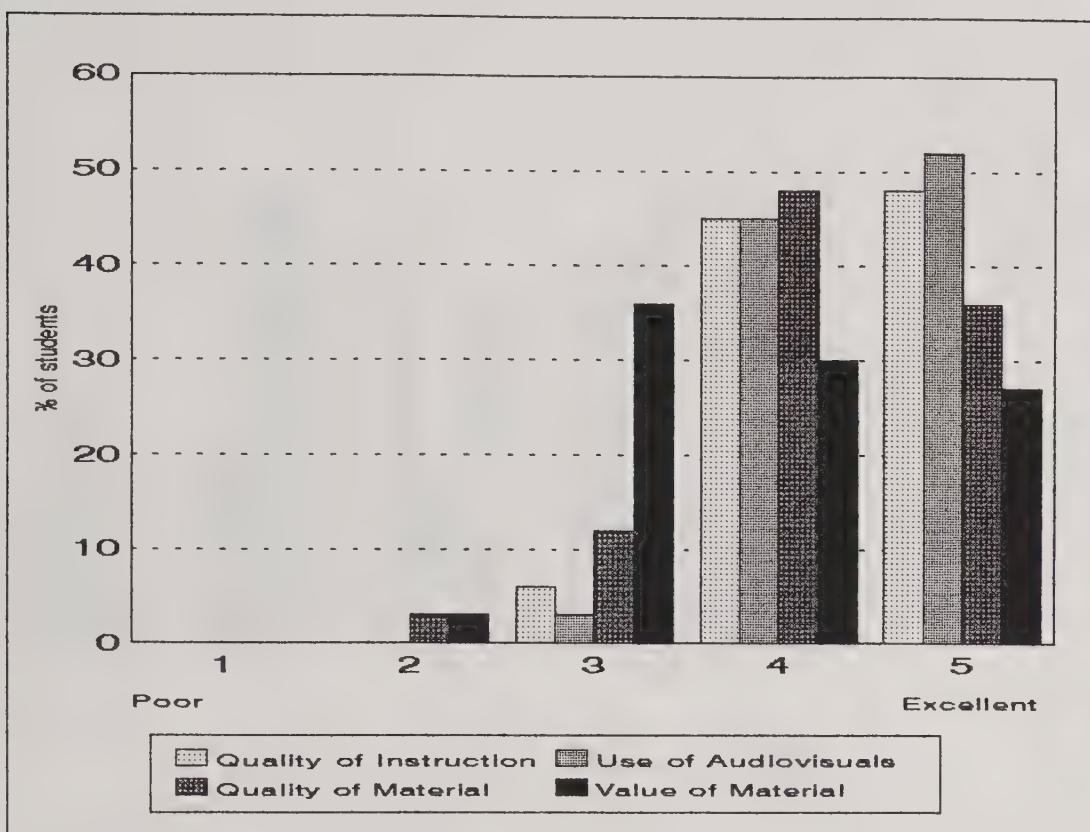


	Quality of Instruction	Use of Audiovisuals
Mean	4.47	3.84
	3	2
	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.44	4.00
	3	3
	5	5

#### Comments:

- 1) All state cooperators dealing with federal programs should have this
- 2) I wasn't looking forward to this talk, but was pleasantly surprised
- 3) Very valuable; excellent speaker
- 4) This is an ongoing topic that will always need to be discussed

## III-A1: Biological Analysis

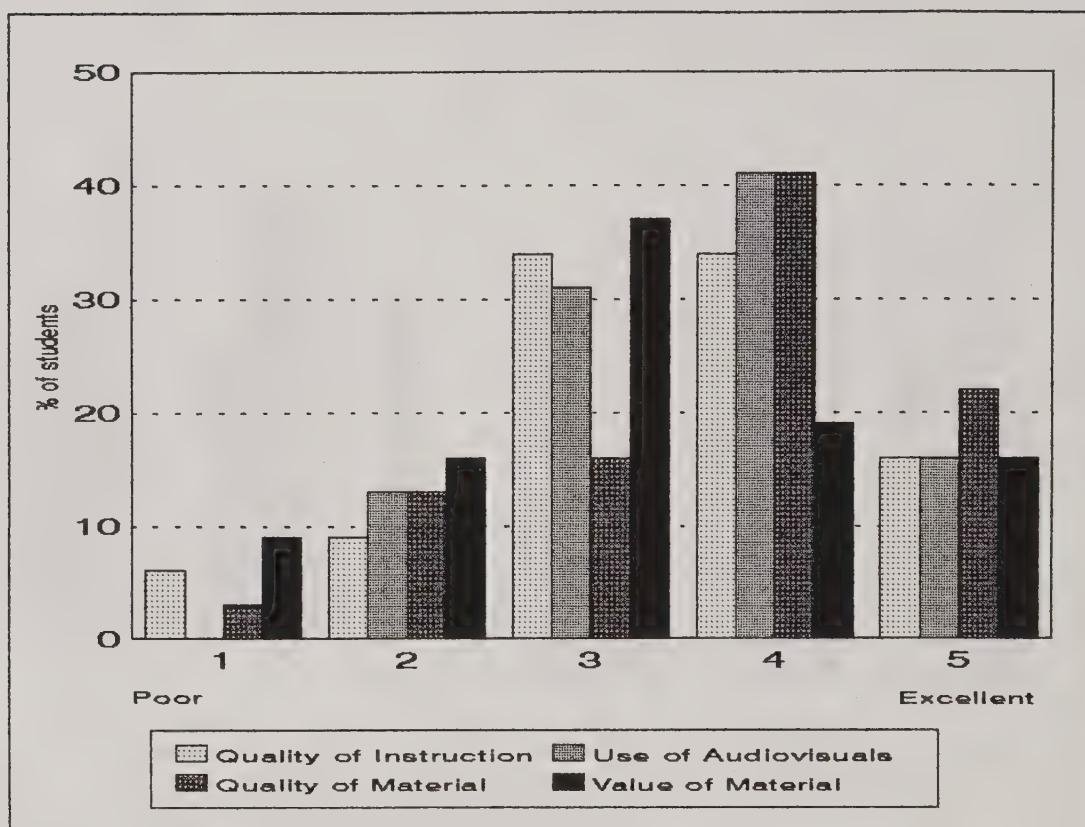


	Quality of Instruction	Use of Audiovisuals
Mean	4.42	4.48
	3	3
	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.18	3.73
Minimum	2	2
Maximum	5	5

Comments:

- 1) Maybe use a specific example for one pest from the request to report of the biological evaluation
- 2) Would have liked to hear more about indirect & direct effects on other resources, species
- 3) More accurate info on gypsy moth defoliation/mortality would be good

## III-A2: Economic Analysis

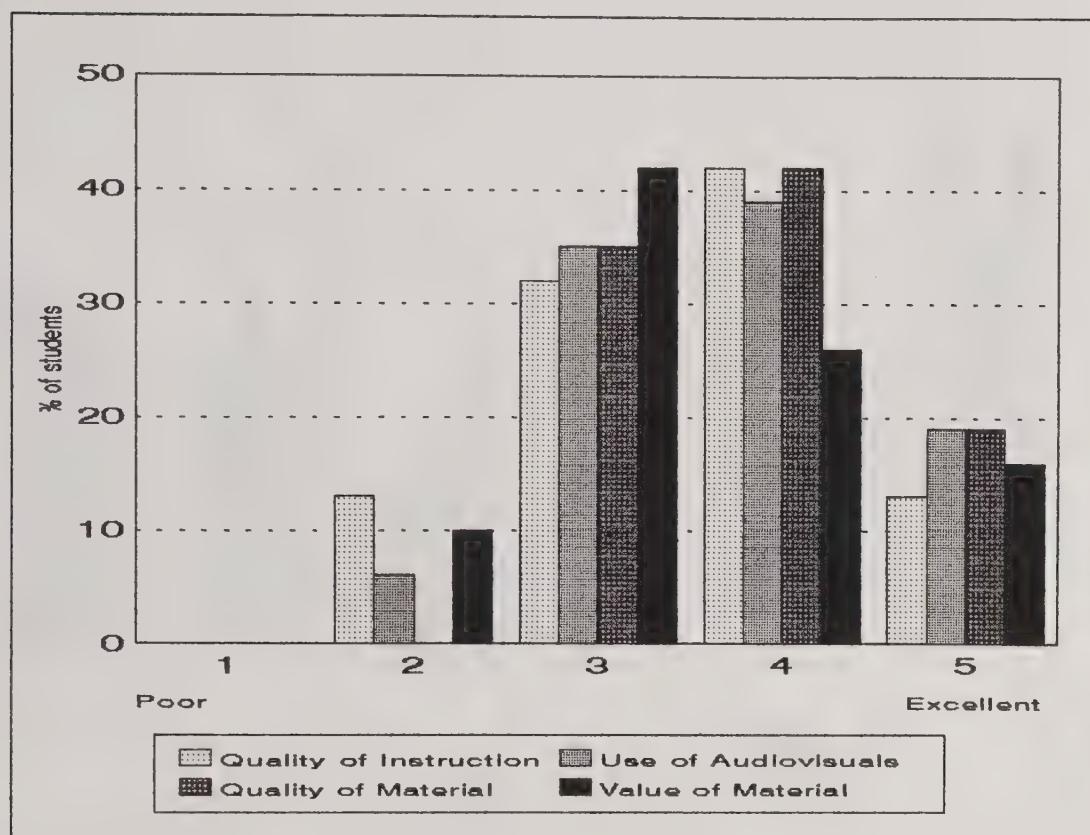


	Quality of Instruction	Use of Audiovisuals
Mean	3.44	3.59
Minimum	1	2
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	3.47	3.06
Minimum	1	1
Maximum	5	5

### Comments:

- 1) Subject material somewhat dry
- 2) Expand on non-commodity or urban values common in East on gypsy moth projects
- 3) Don't use overheads on viewer
- 4) Less detail; more of an overview
- 5) Spend more time on resources other than timber

### III-A3: Social/Political Analysis

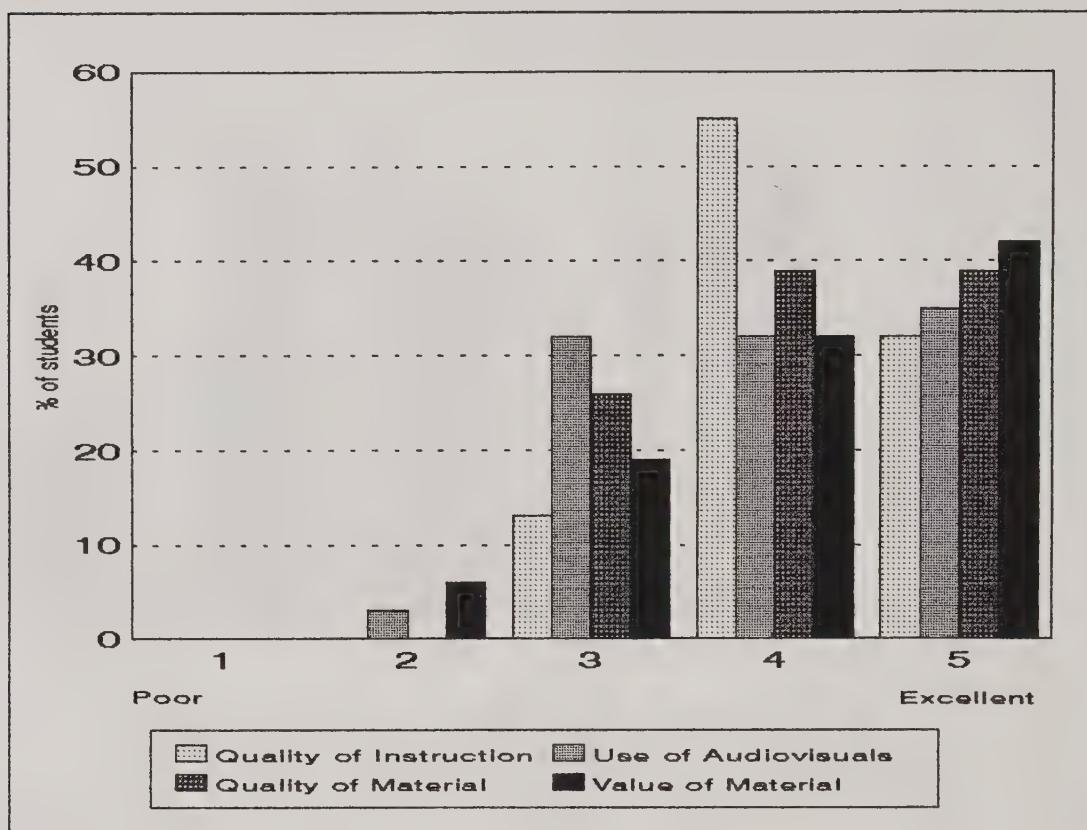


	Quality of Instruction	Use of Audiovisuals
Mean	3.55	3.71
	2	2
	5	5
	Quality of Material Presented	Value of Material to Student
Mean	3.71	3.29
Minimum	3	2
Maximum	5	5

#### Comments:

- 1) Need an outline of the text and the purpose of this analysis
- 2) Provide examples from projects to illustrate how--and what--social issues to analyze
- 3) Reading the presentation makes it less spontaneous and interesting

## III-B: Risk Assessment and Toxicology

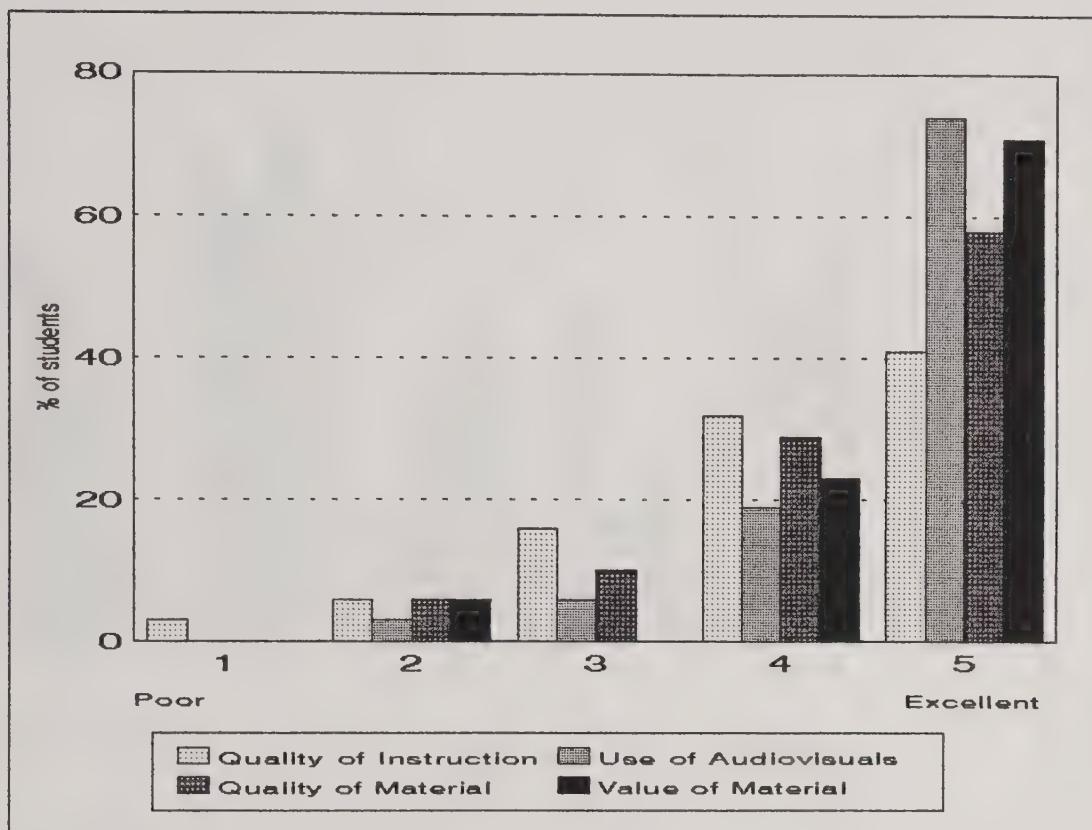


	Quality of Instruction	Use of Audiovisuals
Mean	4.19	4.10
	3	2
	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.26	4.10
Minimum	3	2
Maximum	5	5

Comments:

- 1) Good info--good review
- 2) Don't use the word "gimp"
- 3) Give examples of how we will use assessment and toxicology data
- 4) Add references for use of people who haven't completed a risk assessment
- 5) Good coverage of a tough subject
- 6) More time needed

### III-C: Risk Communication

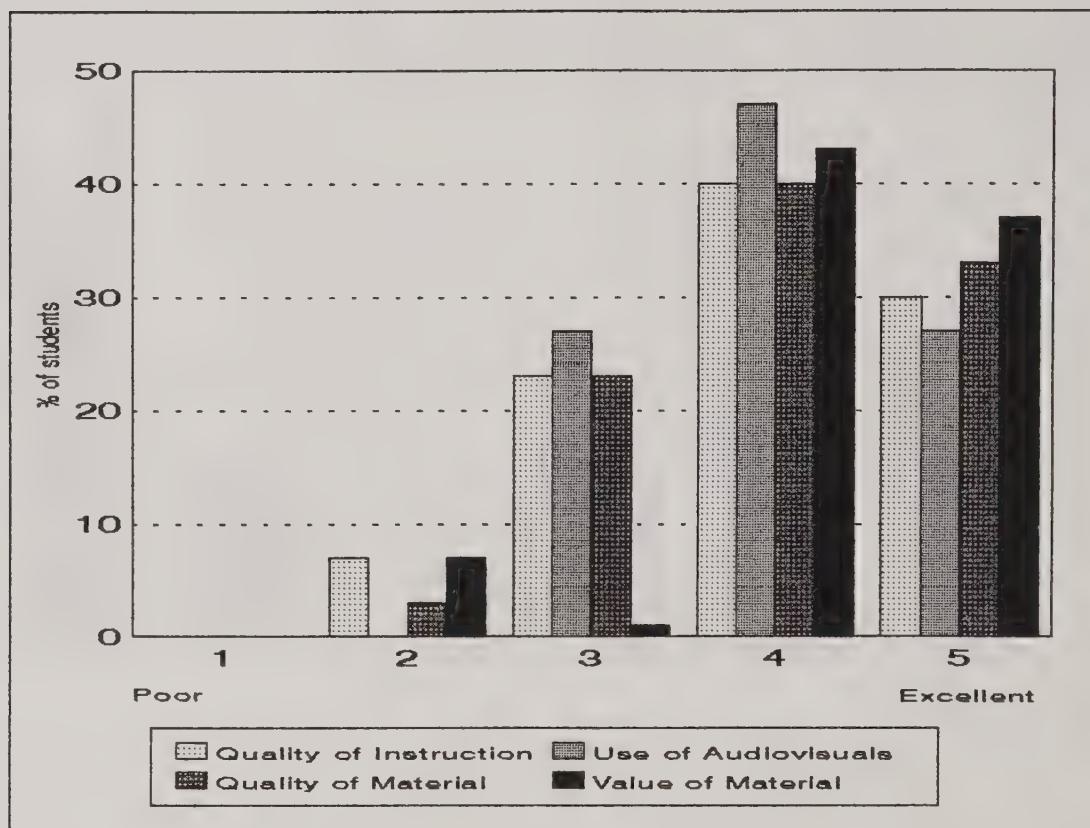


	Quality of Instruction	Use of Audiovisuals
Mean	4.03	4.74
	1	2
	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.48	4.58
Minimum	2	2
Maximum	5	5

Comments:

- 1) Show entire video!
- 2) Require line officers to see video
- 3) Very interesting and entertaining; new concept to me
- 4) Incorporate group interaction/discussion--local topics, examples
- 5) More time--this was great!
- 6) Make this a two-hour presentation and show whole video

## III-D: T&E Species and Pesticides

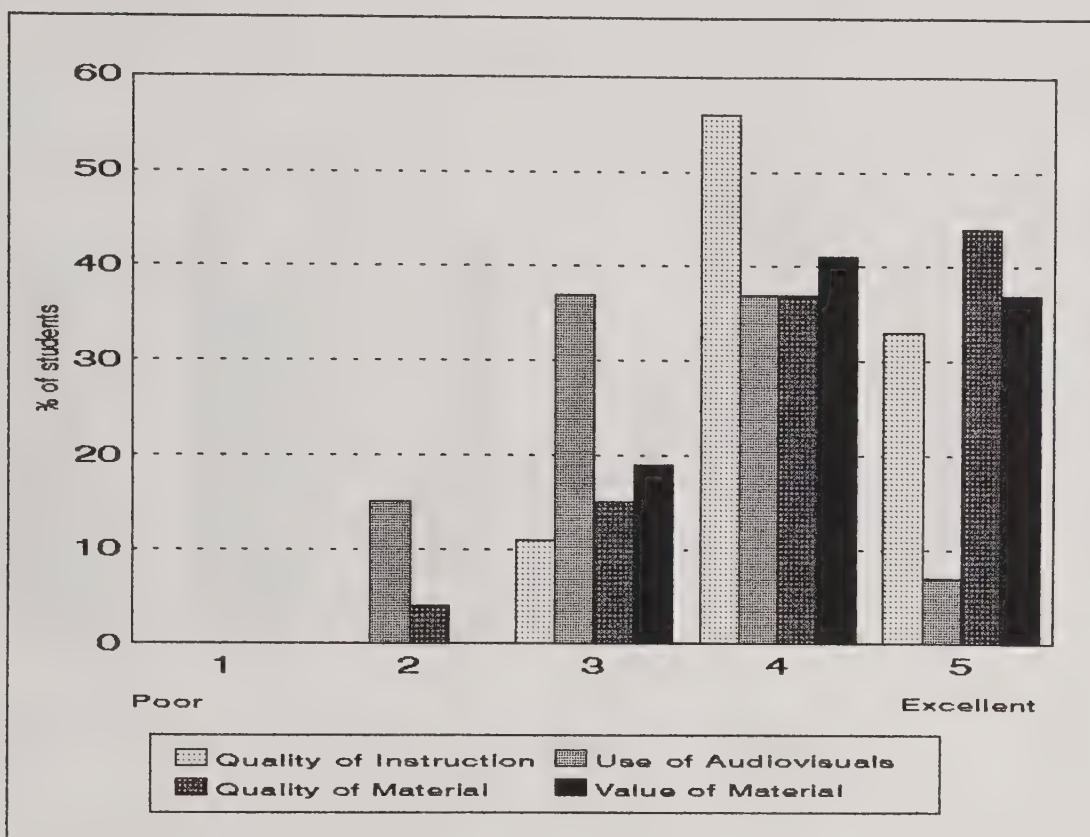


	Quality of Instruction	Use of Audiovisuals
Mean Minimum Maximum	3.93	4.00
	2	3
	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.03	4.00
Minimum	2	2
Maximum	5	5

Comments:

- 1) Speaker was repeatedly interrupted by other faculty during her presentation, which seemed disruptive
- 2) Should have allowed more time for this section / great job
- 3) What is the process for any agency to follow to determine if they must consider T&E?
- 4) This information is important & needs exposure in such forums

### III-E: Human Exposure / Personnel Protection

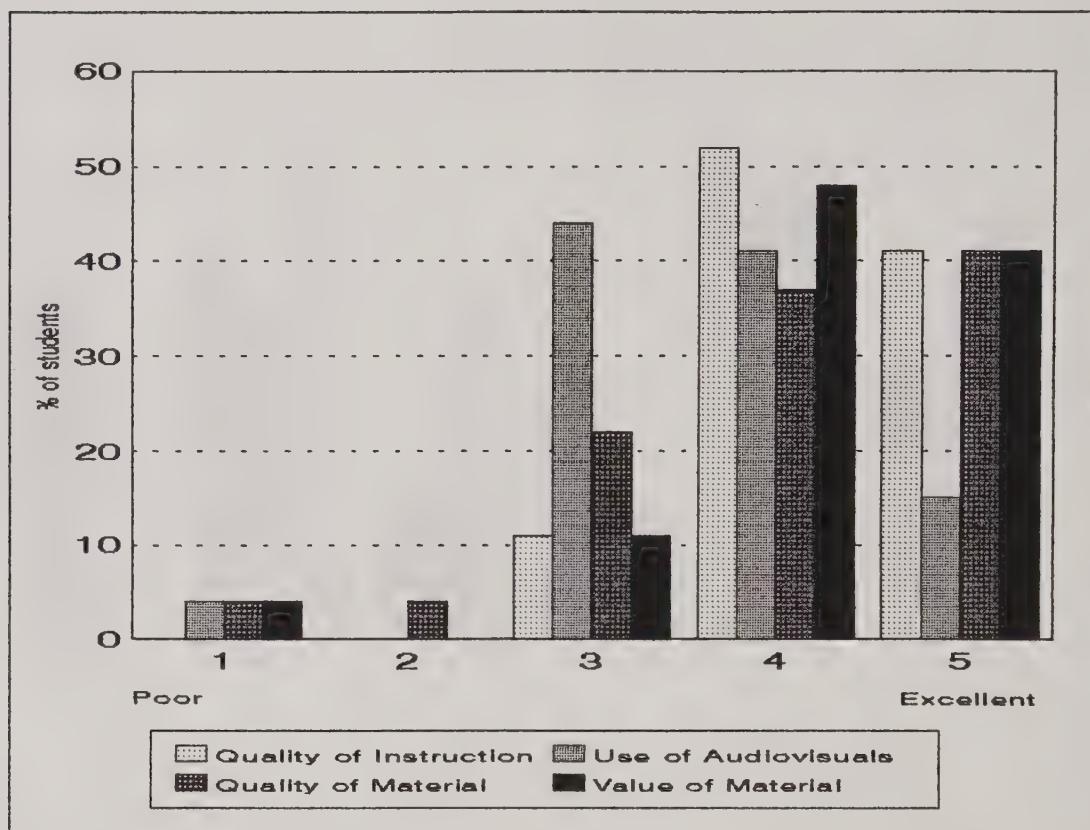


	Quality of Instruction	Use of Audiovisuals
Mean	4.22	3.26
	3	2
	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.22	4.04
Minimum	2	3
Maximum	5	5

Comments:

- 1) Put overheads on slides
- 2) Better overheads / overheads too hard to read
- 3) Excellent use of personal experience examples
- 4) Reference to hispanic crew unnecessary and inappropriate

## III-F: Worker Protection Standards

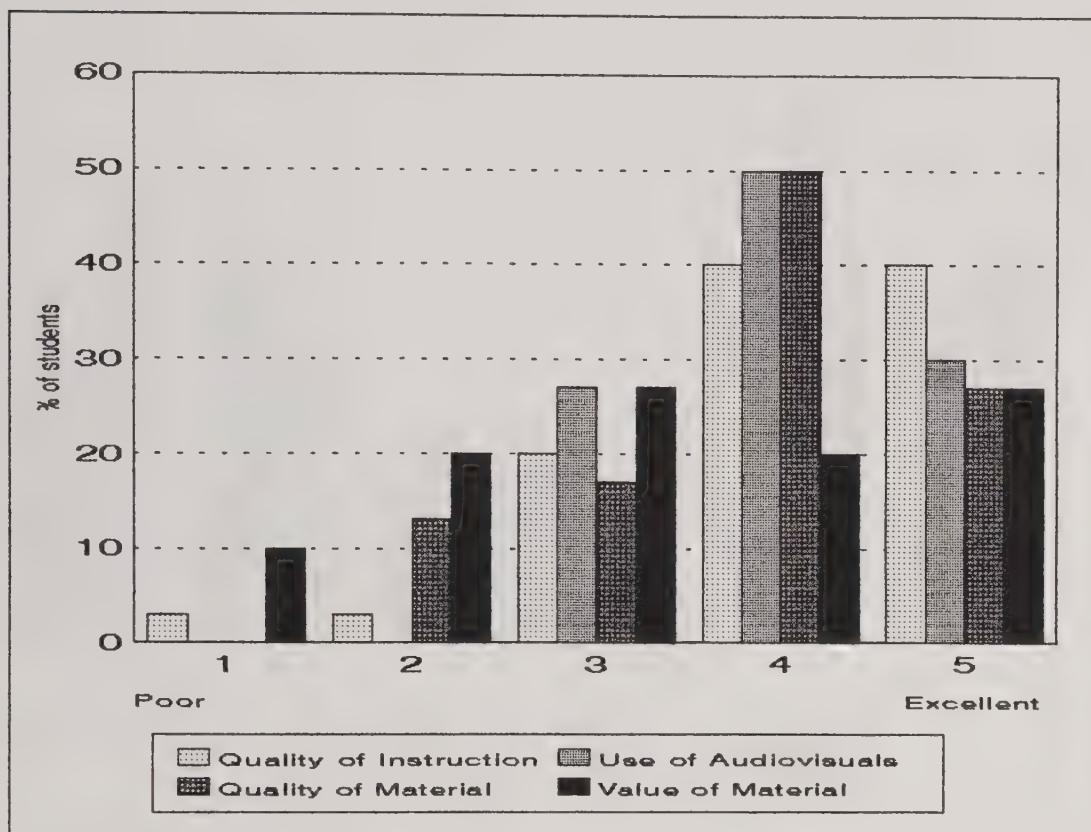


	Quality of Instruction	Use of Audiovisuals
Mean	4.44	3.74
	3	1
	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.30	4.33
Minimum	1	1
Maximum	5	5

Comments:

- 1) Please use non-gender specific terms
- 2) Add copies of law and federal register
- 3) Presentation was effective, but why wasn't it given by EPA rep. Jones?
- 4) Good presentation - WPS is another complicated set of regs.
- 5) Too much emphasis on ground application of herbicides
- 6) Should have had EPA manual

## III-H: Good Laboratory Practices

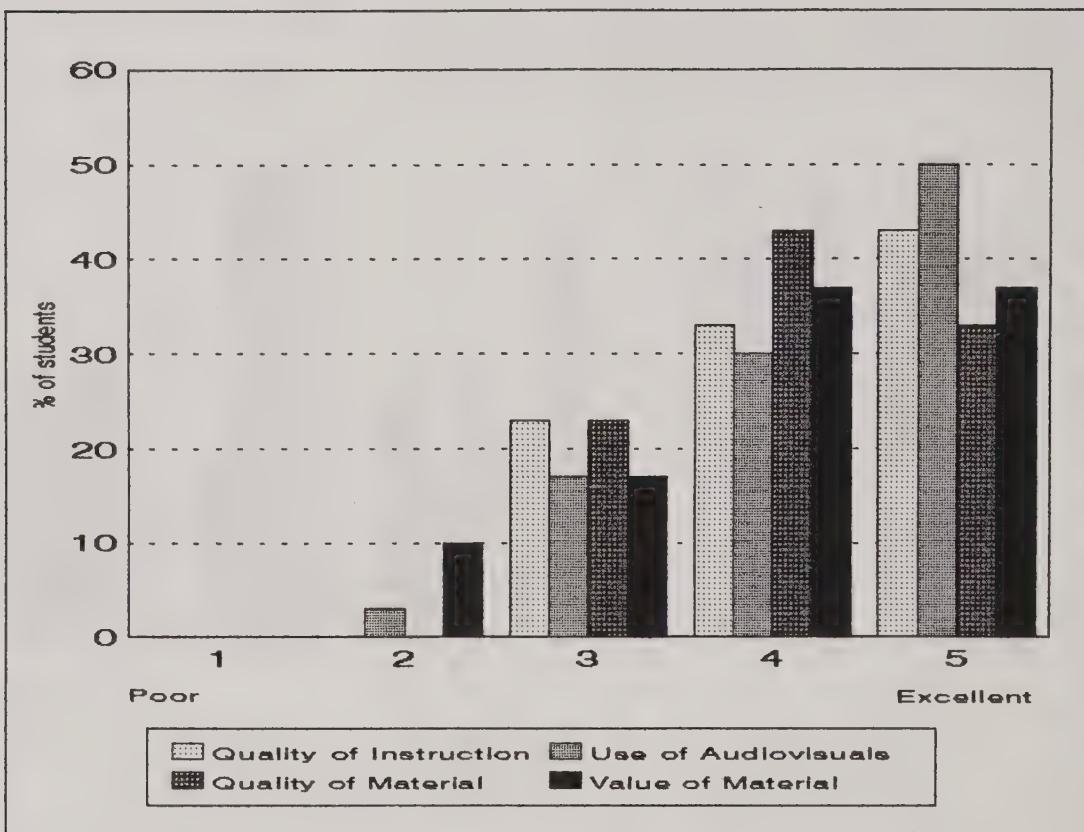


	Quality of Instruction	Use of Audiovisuals
Mean	4.30	4.30
	1	3
	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.10	3.43
Minimum	2	1
Maximum	5	5

Comments:

- 1) Does this apply to forest mgt., or just to laboratories?
- 2) Excellent for what I need in bioassays
- 3) Taylor more toward application/monitoring rather than development
- 4) Important as a refresher course - we need to be reminded
- 5) Slow down speech - too fast
- 6) Illustrate how GLP applies to pesticide applicators

### III-I: Safety Equipment Demonstration

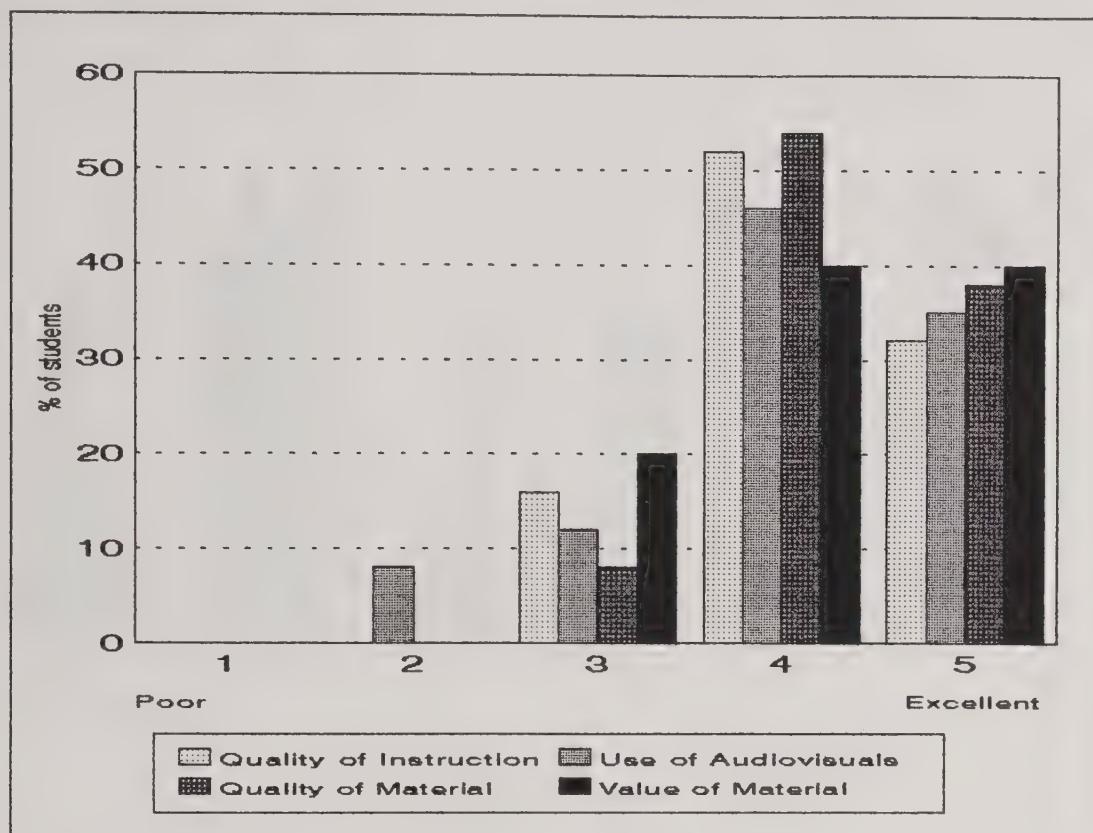


	Quality of Instruction	Use of Audiovisuals
Mean	4.20	4.26
	3	2
	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.10	4.00
Minimum	3	2
Maximum	5	5

Comments:

- 1) Very well done presentation
- 2) Very informative
- 3) Relate safety products to specific pesticides; less on respirators
- 4) Very well prepared; visuals covered the subject well

### III-J: Fate of Pesticides in the Environment

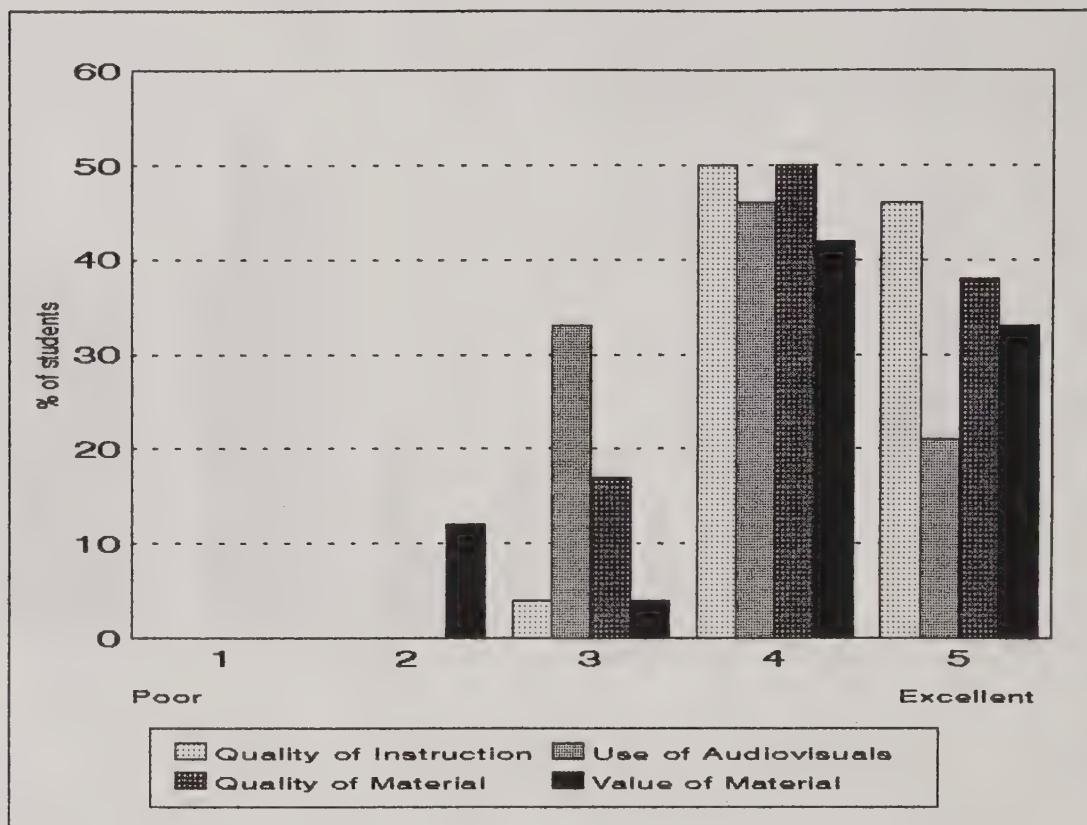


	Quality of Instruction	Use of Audiovisuals
Mean	4.16	4.08
	3	2
	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.31	3.80
Minimum	3	3
Maximum	5	5

Comments:

- 1) Good speaker; useful info.
- 2) Need more about fate, less about monitoring and sampling technology
- 3) Some slides too dark
- 4) Good review of procedures
- 5) More about effects of pesticides on the environment
- 6) Better job of balancing herbicide and insecticide material than other instructors

## III-K: Pesticide/Hazmat Management and Disposal

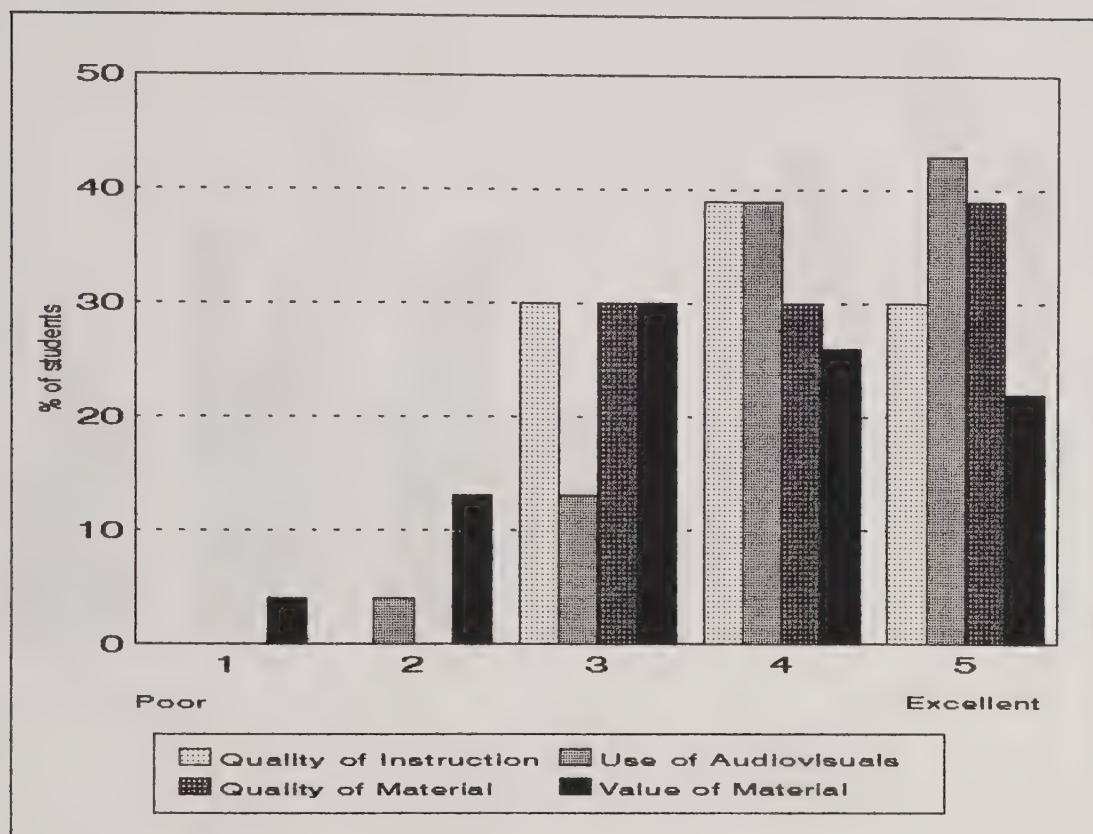


	Quality of Instruction	Use of Audiovisuals
Mean	4.42	3.87
Minimum	3	3
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.38	3.71
Minimum	3	2
Maximum	5	5

### Comments:

- 1) Complicated issue - good job of explaining it
- 2) Provide ordering info. for RCRA manuals
- 3) Make recommendations on how to prevent substance from becoming a waste
- 4) Shorten it

### III-L: Sampling Spray Drift

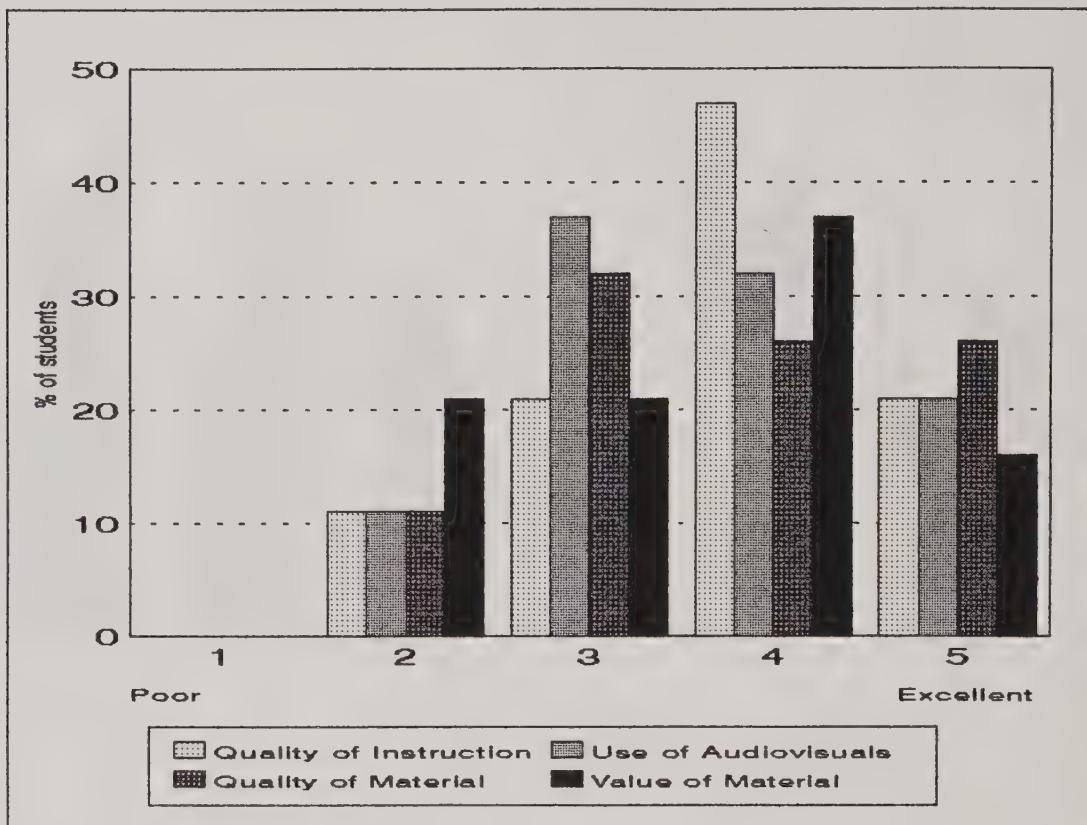


	Quality of Instruction	Use of Audiovisuals
Mean	4.00	4.22
Minimum	3	2
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.01	3.35
Minimum	3	1
Maximum	5	5

Comments:

- 1) Most of us will never get to the stage where we are responsible for this
- 2) Too much detail
- 3) Good demonstration

### III-M: Environmental Fate Models

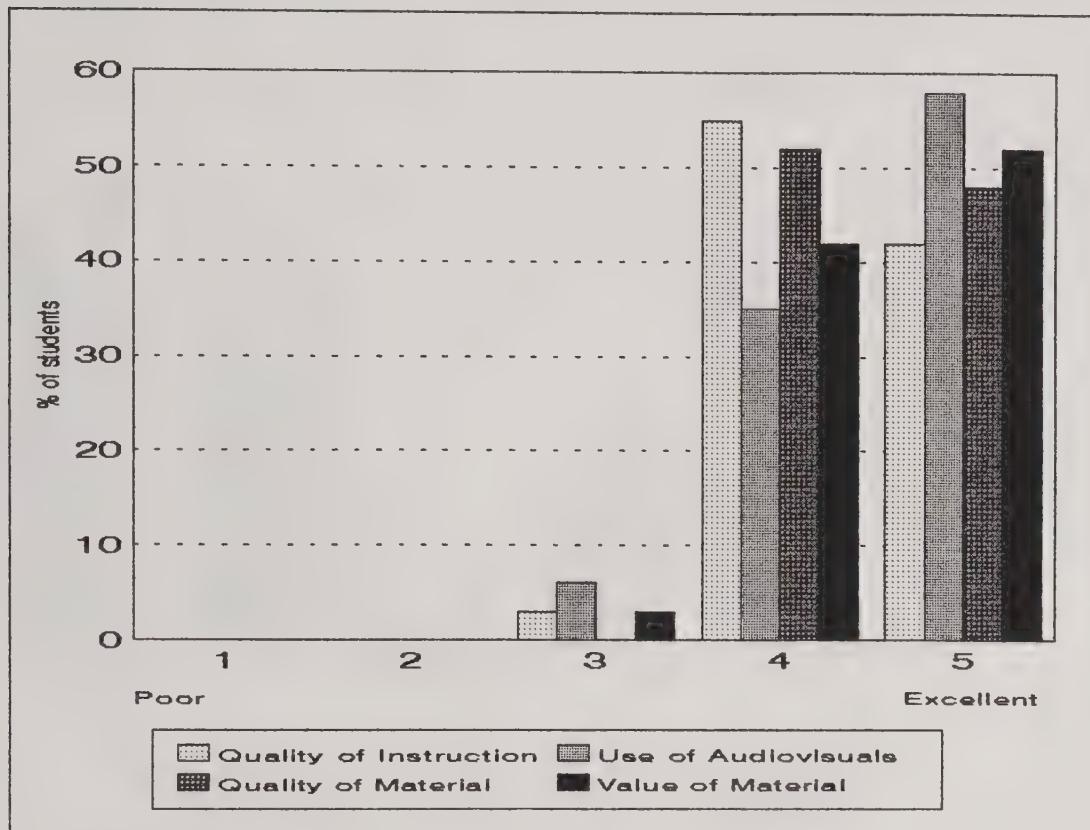


	Quality of Instruction	Use of Audiovisuals
Mean	3.79	3.63
Minimum	2	2
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	3.53	3.32
Minimum	2	2
Maximum	5	5

Comments:

- 1) Good discussion on how models only yield relative differences
- 2) Pennel et al reprint poorly copied, holes punched through text
- 3) Not enough time

## III-N: Hands-On Calibration

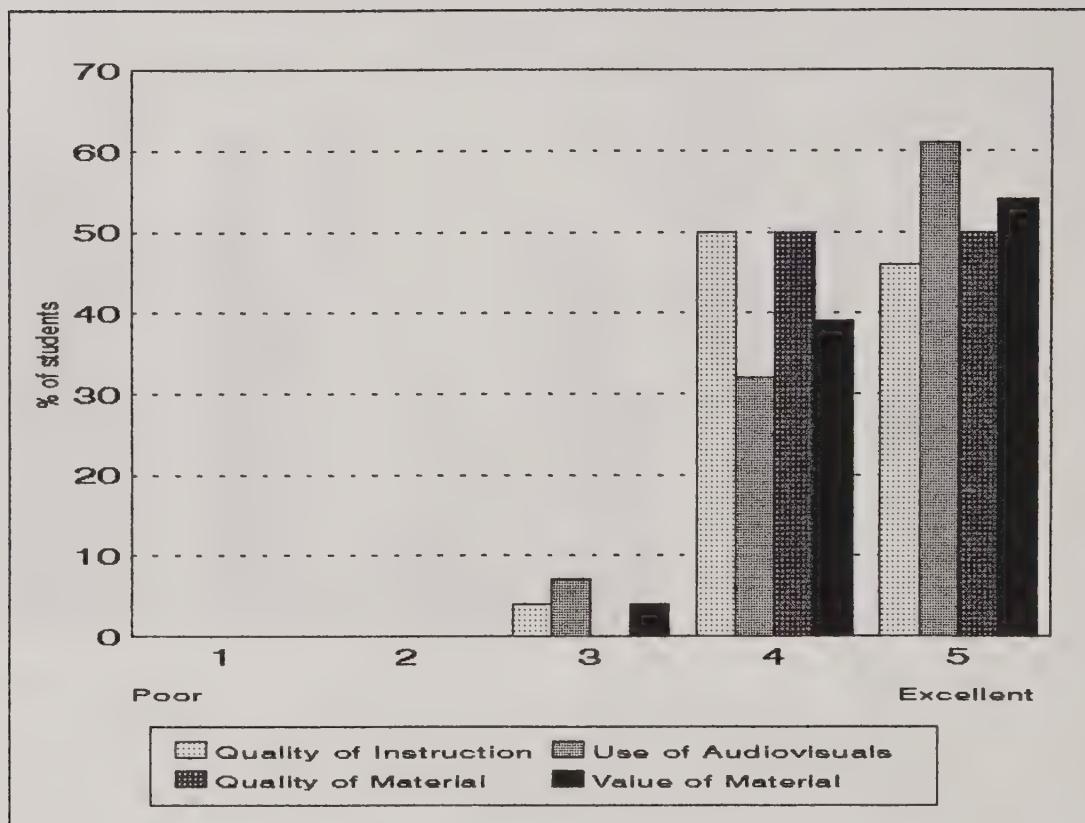


	Quality of Instruction	Use of Audiovisuals
Mean	4.39	4.52
Minimum	3	3
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
	4.48	4.35
Mean	4.48	4.35
Minimum	4	3
Maximum	5	5

Comments:

- 1) Good outside/interactive exercise
- 2) Too many guesses and assumptions for uninitiated
- 3) Provide several pressure gauges along boom to show pressure drop
- 4) Mount pressure gauges on boom, not pump
- 5) Use more fixed parameters; we agonized over unimportant factors

## III-N2: Calibration Procedures

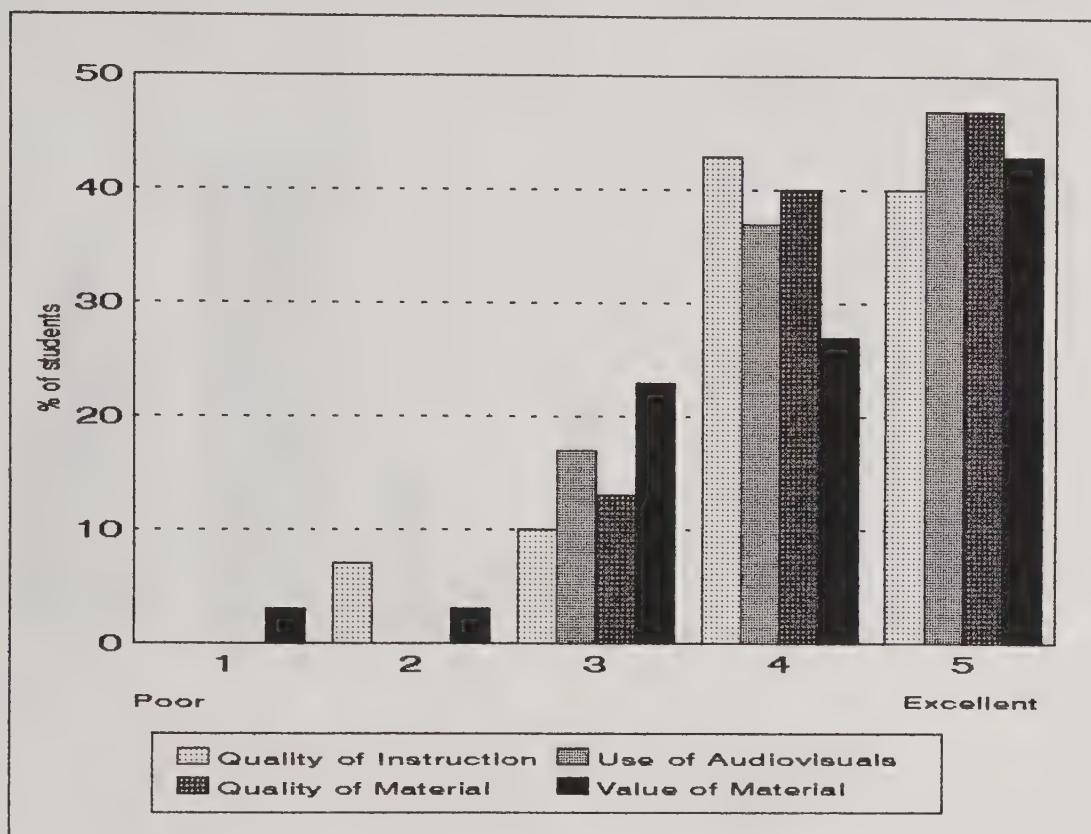


	Quality of Instruction	Use of Audiovisuals
Mean	4.43	4.54
Minimum	3	3
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.50	4.36
Minimum	4	3
Maximum	5	5

Comments:

- 1) Define more parameters in practical exercises
- 2) suggested problem - aircraft arriving at a project, can it meet application rates?
- 3) Install pressure gauges on boom
- 4) Liked the calibrator
- 5) Good outdoor exercises
- 6) Had plenty of time
- 7) Needed more time

## III-O: Immunoassay Techniques

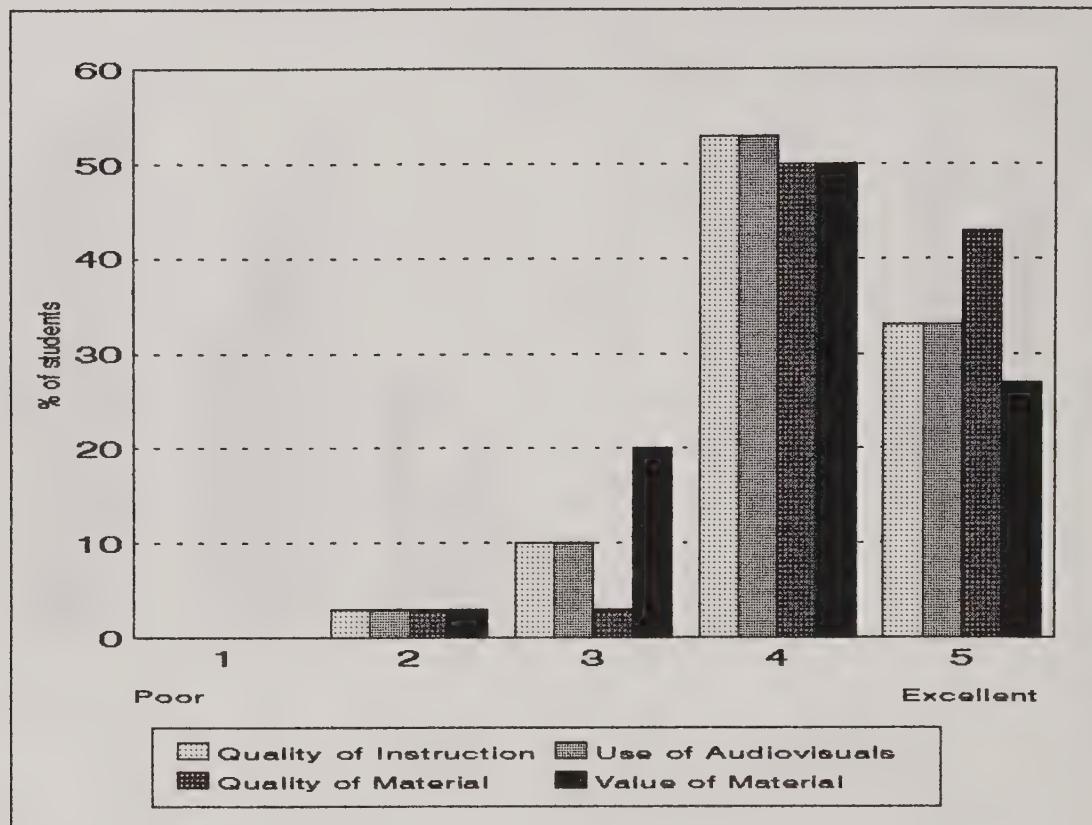


	Quality of Instruction	Use of Audiovisuals
Mean	4.17	4.30
	2	3
	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.33	4.03
Minimum	3	1
Maximum	5	5

### Comments:

- 1) New technology I wasn't aware of
- 2) Excellent!
- 3) Good info on basics of immunoassay - well done
- 4) Do an actual demonstration, step-by-step

### III-P: Burning Pesticide-Treated Materials

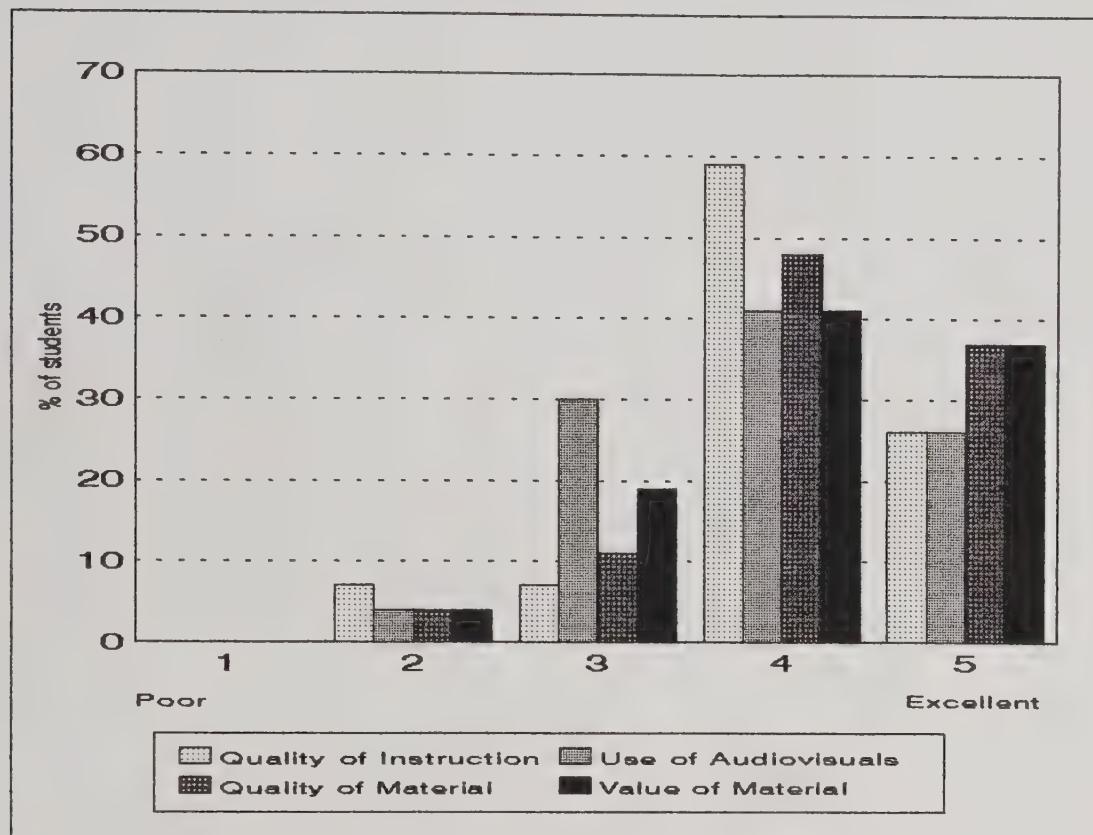


	Quality of Instruction	Use of Audiovisuals
Mean	4.17	4.17
	2	2
	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.53	4.00
Minimum	2	2
Maximum	5	5

Comments:

- 1) Good stuff!
- 2) Include discussion of natural products of burning that present a hazard
- 3) Refreshing to hear answers to questions asked in study - accustomed to waiting
- 4) Answered questions I have had before
- 5) First good talk I heard on this subject

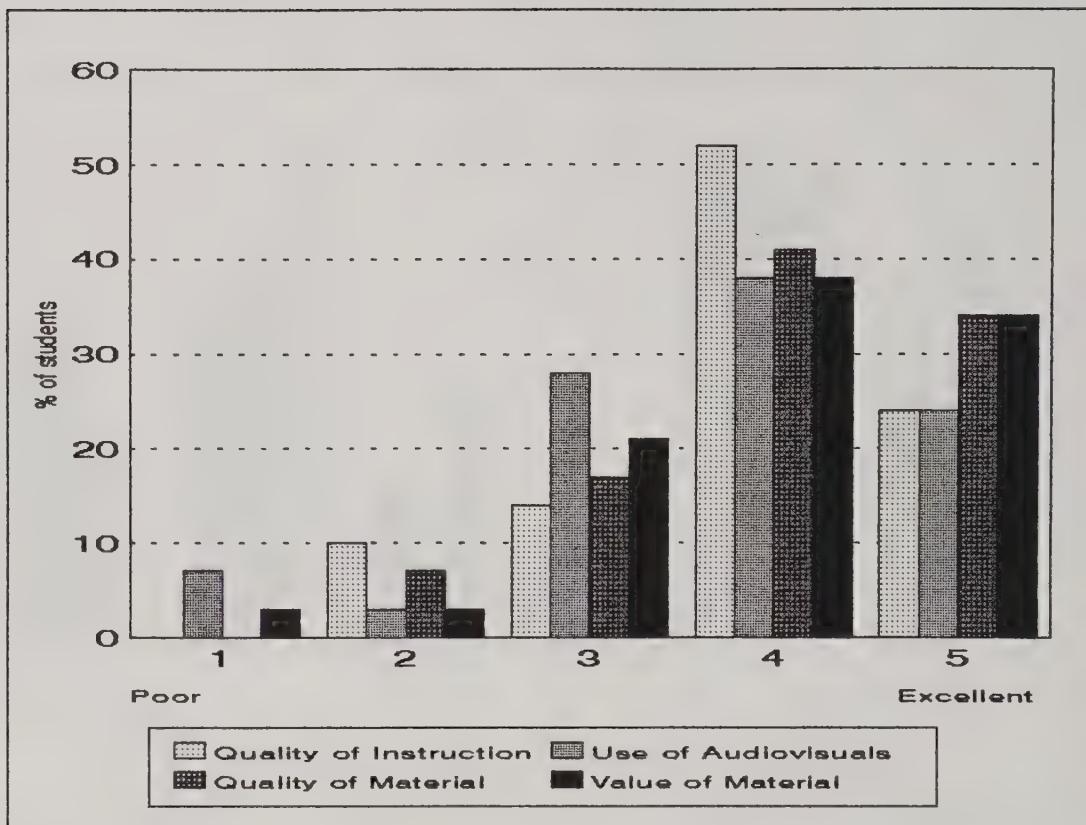
### III-Q: Characterization



	Quality of Instruction	Use of Audiovisuals
Mean	4.04	3.89
Minimum	2	2
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.19	4.11
Minimum	2	2
Maximum	5	5

Comments:  
(None)

## III-R: Swath Kit



	Quality of Instruction	Use of Audiovisuals
Mean	3.90	3.69
Minimum	2	1
Maximum	5	5
	Quality of Material Presented	Value of Material to Student
Mean	4.03	3.97
Minimum	2	1
Maximum	5	5

### Comments:

- 1) Slow down; could not follow at that speed
- 2) Need swath kit; have backup available locally
- 3) Excellent job

## Summary Critique of the Herbicide Module

Ed Monnig



## SECTION 1. SUMMARY OF HERBICIDE MODULE EVALUATIONS

### MODULE OBJECTIVES

**Question 1.** Did the content of this module support the module objective?

All but one respondent felt the content supported the module objective. The one nay sayer felt it was too slanted to the Forest Service and that no mention was ever made of the Lake States.

**Question 2.** Did instructors demonstrate how lessons relate to practical situations?

All but one respondent answered "yes" to this question. One respondent complained that only the western and southeast US was covered (same respondent as objecting in Question 1.)

**Question 3.** What topics do you believe should be added, given additional emphasis, and/or additional time?

Individual comments included:

Ignored the Northeast (Several commenters wanted more material on this part of the country.)

Ignored electronic spray control systems, how they work and how to calibrate.

Monitoring topics on Wednesday morning didn't get allotted time.

Add time to Biocontrol.

Add time for water monitoring.

More information on specific herbicides (both by chemical class and trade name.)

More info on exotic weeds.

Add more info on rangeland besides the intermountain west.

Provide more information on thresholds of concern and when to monitor aquatic systems.

More info on experimental results of studies on various adjuvants and the practical implications.

Provide info/approaches/handouts to promote pesticide use to home units and interest groups.

More info on mode of action and structures of herbicides.

**Question 4.** What should be deleted.

Individual comments included:

Less time on field trip or eliminate it.

Less time on silvicultural practices.

Some students objected to the fact that some of the calibration and equipment material was repeated from the calibration lectures in the insecticide modules.

**Question 5.** What module materials should be available for advance reading?

No comments were received on this question.

**Question 6.** Other recommendations on module content.

Individual comments include:

Rerun calibration exercises on an individual basis.

As part of the course students should develop a management plan or prescription for situation involving herbicide use.

Eliminate duplication between modules.

One commenter recommended that the insecticide module have more info similar to the herbicide module on the effectiveness of treatment alternatives.

One commenter noted requested that each speaker bring an outline of his/her talk and other handouts. Although many did, some didn't.

Minimize the Forest Service culture/jargon. Run classes on the weekends.

## **FACULTY, FACILITIES, AND ADMINISTRATION**

**Question 1.** Did the faculty provide sufficient assistance to you throughout the module?

Comments on the faculty were universally positive, with the possible exception of providing more handouts of their material.

**Question 2.** What are the advantages and disadvantages of conducting the module at NARTC?

Most students were complimentary of the excellent classroom facilities at NARTC.

Surprisingly the students were divided on whether the isolation of NARTC was an advantage or a disadvantage. Many saw an advantage in being somewhat isolated in that it fostered more group interaction.

Overall most students said that the advantages of NARTC outweighed the disadvantages.

## **SUMMARY**

Most students gave the course a rating of "8" with a range of scores of 6 to 10 and an average score of 8.1.

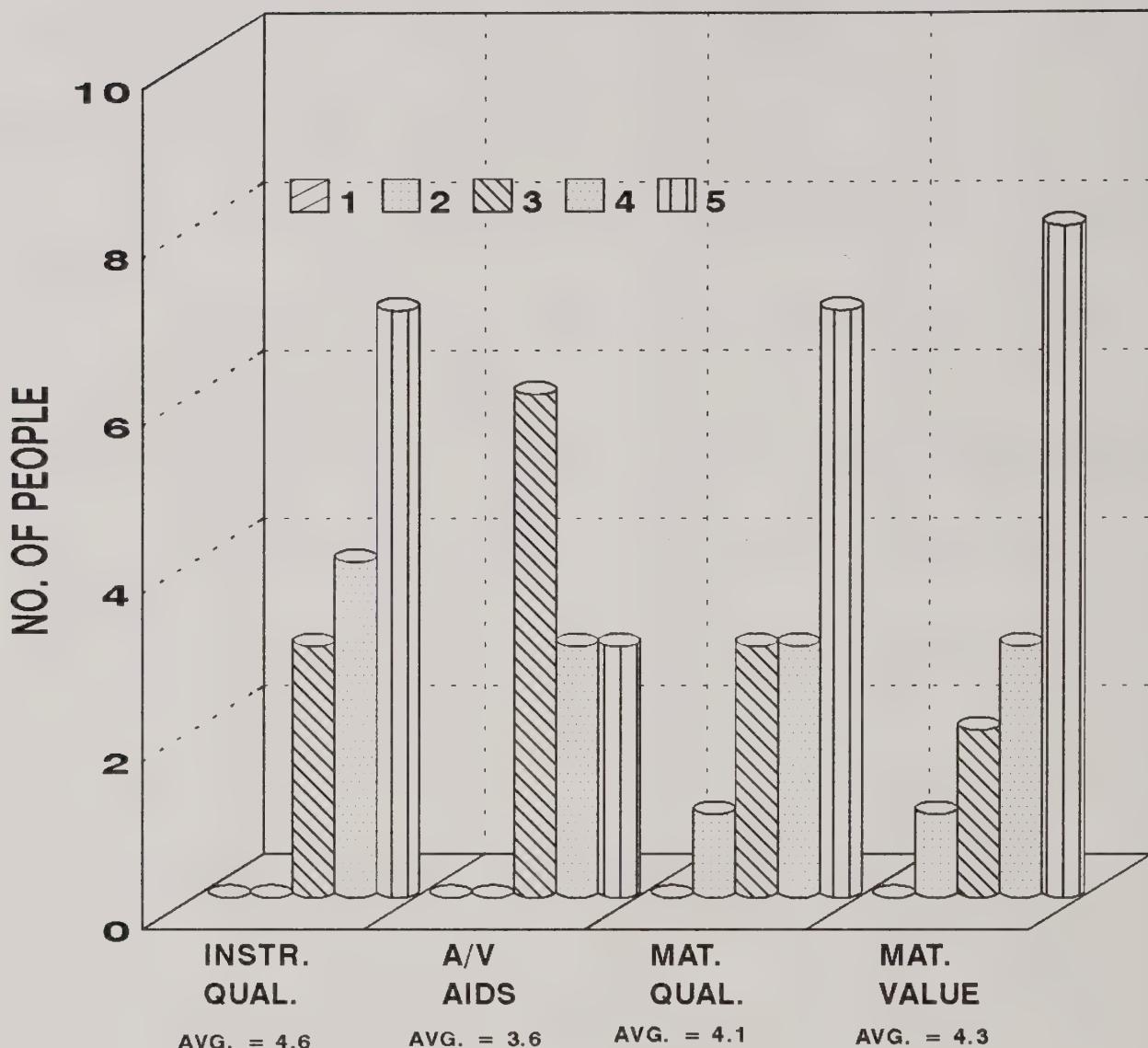
## IV-A GLOBAL USE OF HERBICIDES IN FOREST MANAGEMENT



### **\*\* Written Comments \*\***

- Like to have statistics on slides as handout.
- Could increase discussion by soliciting students' examples of discussion points.
- Good slides & data
- Provide data of slides in student handouts
- I'd like to have copies of the info presented in the slides
- More slides, go slower on data slides
- A relief compared to last week
- Very informative--his presentation was visible and appreciated
- Excellent presentation
- Provide the stats. presented

## IV-B ROLE OF HERBICIDES IN ECOSYSTEM MANAGEMENT

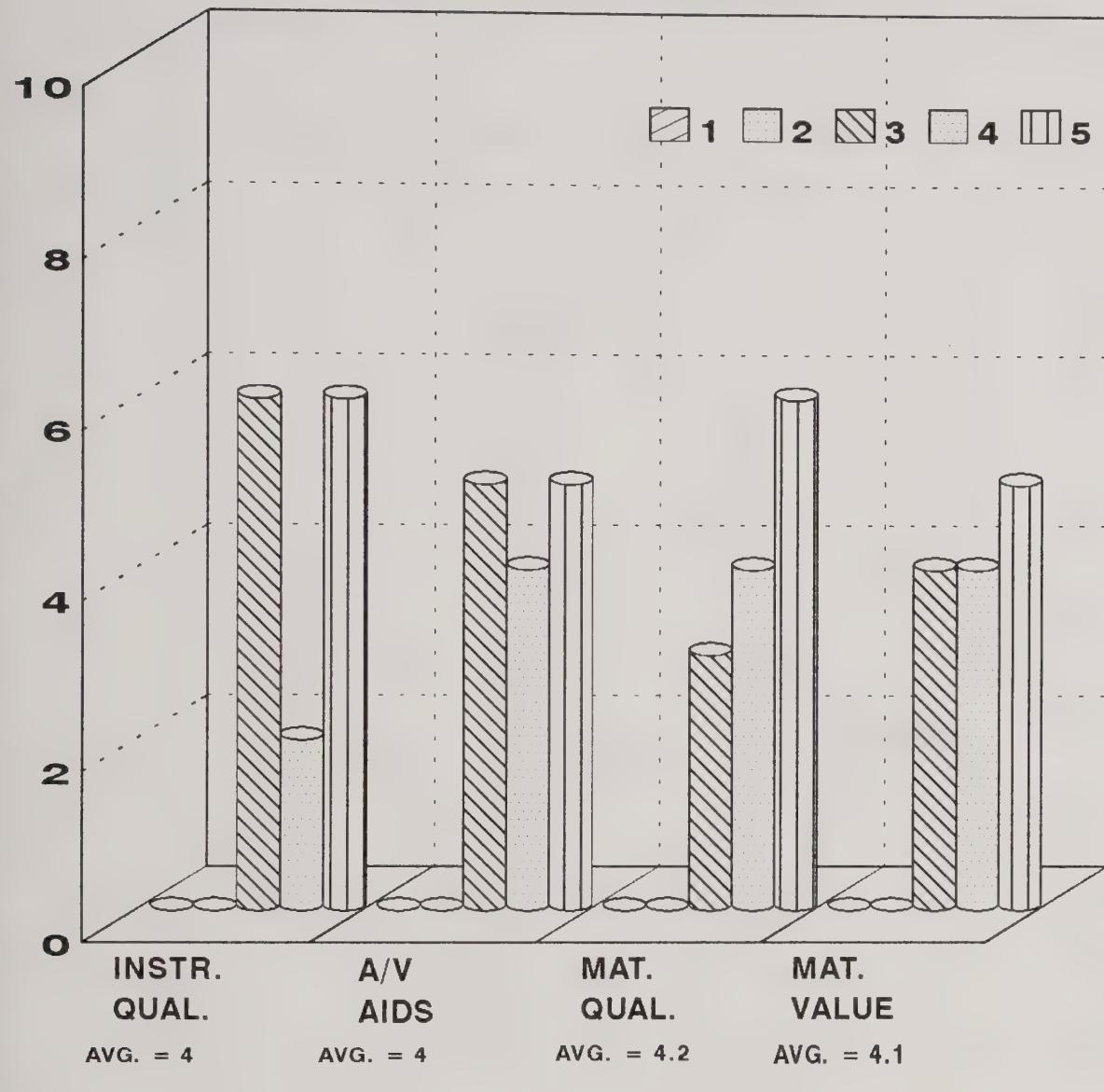


### RATING

#### **\*\* Written Comments \*\***

- Tie speakers to specific questions each must answer.
- What about other agencies? State USFW, etc.
- Good variation in discussion topics.
- Too long an intro vs. opportunity for the panel/student introduction.
- Unsure what the objectives of this unit were exactly.
- Dave Thomas indicated the FS policy is that pesticides are viable in ecosystem management.
- Excellent discussion & presentations.
- Need to have some time for discussion.
- Well done.

## IV-C FOREST USE HERBICIDES, FORMULATIONS, ADJUVANTS

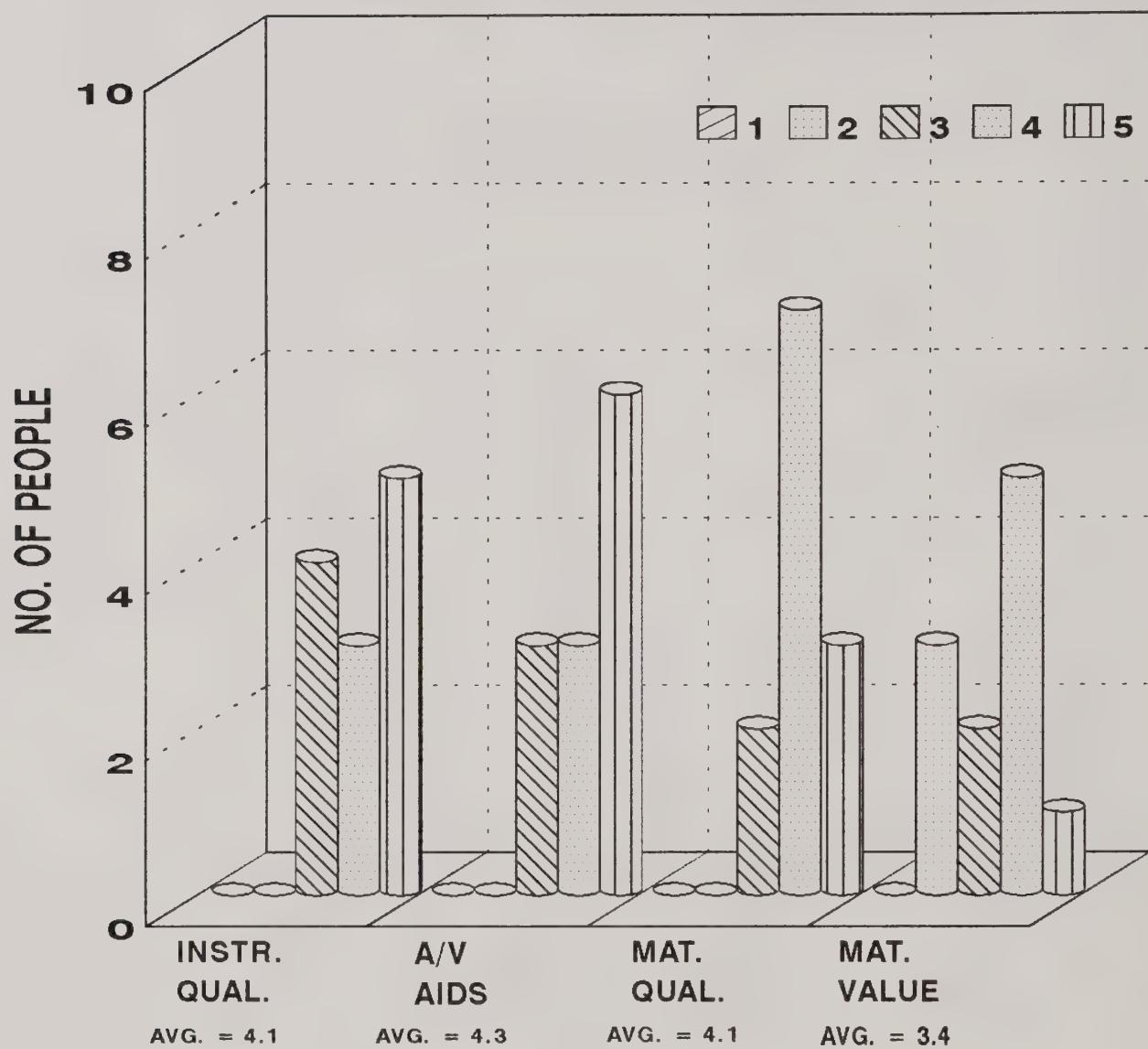


### R A T I N G

#### **\*\* Written Comments \*\***

- Improvements: less material or more time.
- Not enough time.
- Audio/Visual: hard to read; too little time offered to understand.
- More time would have helped.
- Lecture format with little interaction.
- Slides follow workshop outline directly.
- Excellent coverage of topics.
- Improvement: Discussion on efficacy is good. Continued discussion of efficacy data for each adjuvant & discussion of examination of those results (i.e., similar to surfactant data) could use more time, as well as drop size/adjuvant topics.

# IV-D RANGE-USE HERBICIDES, FORMULATIONS, ADJUVANTS NEW PRODUCTS AND USES

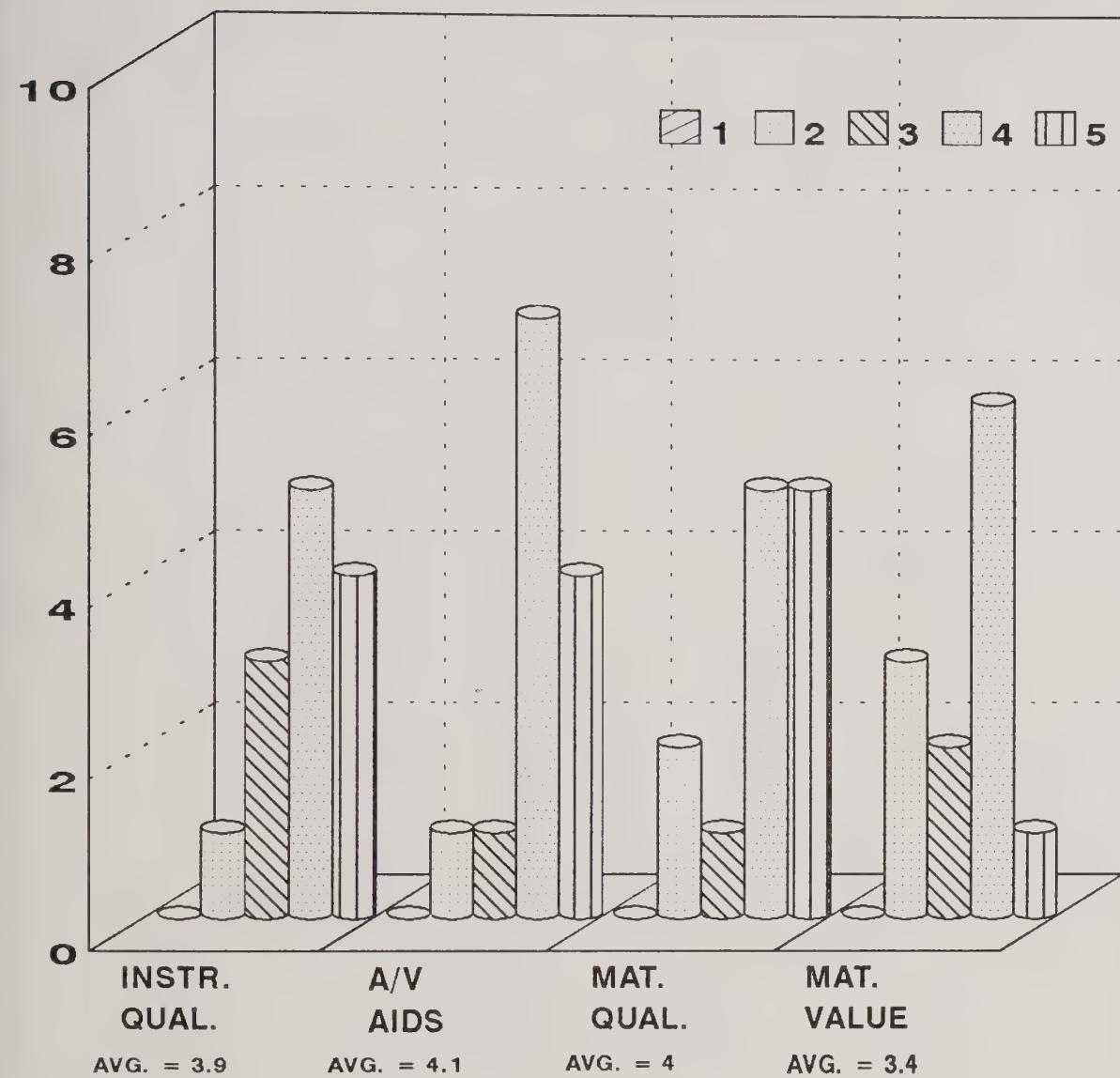


## RATING

### ***\*\* Written Comments \*\****

- Need to move the lecture faster--good management principle presented.
- Faculty should not ask questions or get involved in discussions--leave no time for students to ask questions.
- Good slides.
- Improvement: Too much range for a forester.
- Cut the forestry part short (and rushed it) while spending 2 hours on range.
  - No discussion about what herbicides to use, especially in Lake States.
- Range applications are not relevant to me, but it was worthwhile.
- What are the impacts of these pesticides on non-target species?
- We don't have rangeland on our national forest.

# IV-E SELECTIVE AND SPOT APPLICATION EQUIPMENT AND TECHNIQUES

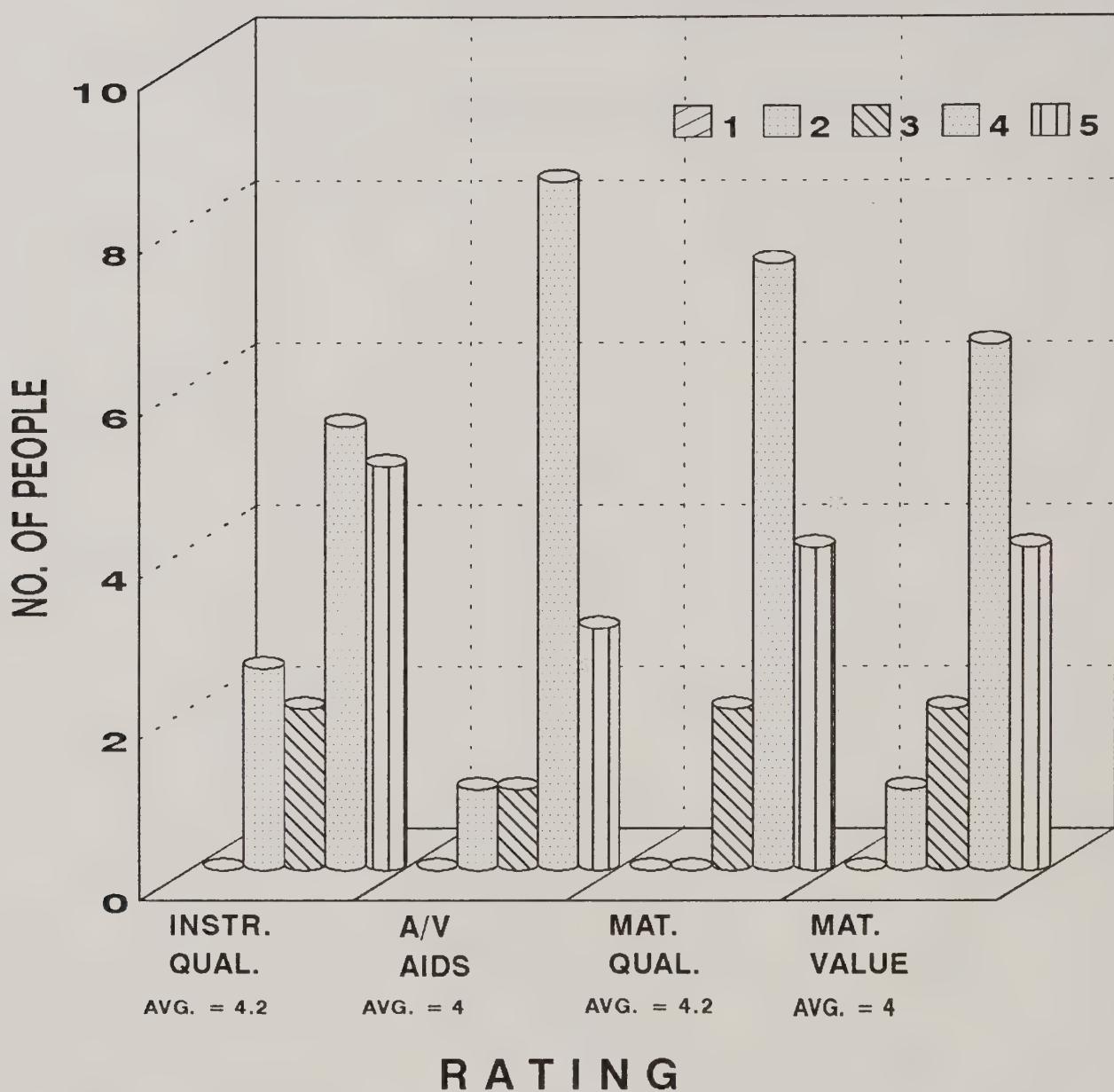


## RATING

### **\*\* Written Comments \*\***

- Quite a bit of material was western oriented. Would like to see more from the east.
- Good audio/video choices.
- Improvement: Perhaps a handout with 1-2 lines describing the slide locations, vegetation, treatment and results.
- Excellent overall.
- Please request that faculty not ask questions--students don't get a chance to ask their questions!
- Slides got repetitious.
- Overall, quite good.
- Improvement: Shorten it, focus on fewer examples. Don't think this is too complicated. Best news was related to movement of material down stem as "more" effective relative to under crown.
- Already knowledgeable of these application techniques.
- Improvement: Shorten this unit by reducing the number of illustrations.
- Too many slides, could shorten this section; don't need so many examples.
- Improvement: Present detail management objectives, then compare results and procedures to accomplishment of objectives.

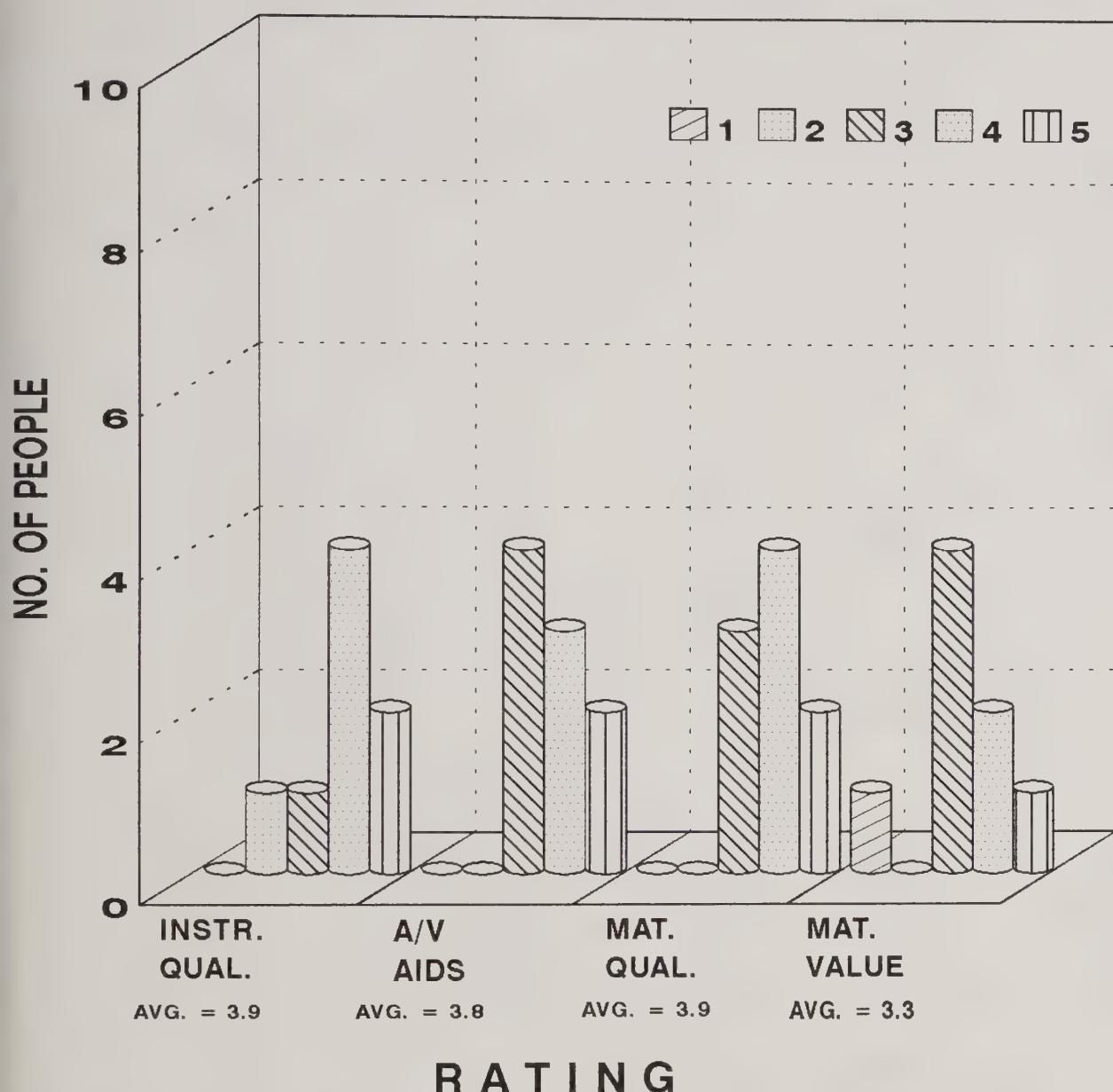
# IV-F SHORT/LONG-TERM EFFECTS OF FOREST-USE HERBICIDES



## \*\* Written Comments \*\*

- Very well tied to Ecosystem Management.
- Valuable overview with enough detail to provide real substance.
- Improve by: lessons focused on short/long-term effects of yields. Supportive studies/bibliography in handout forms describing environmental effects could receive more attention, along the lines of Newton's presentation.
- Add more info about effects on non-target species.
- Need more time for dialogue--good stuff.
- Clear presentation of research results.
- Good data/slides.
- Good discussion on diversity response.
- Improvement: Slides summarize data from research. Student binders should include copies of these slides with referenced research papers.
- EAs and EISs frequently need to display the trends concerning vegetation management, and these graphs and charts would be helpful.
- No mention of NE area forestry. Does it exist? If this is a national workshop, you need to have something for everyone.

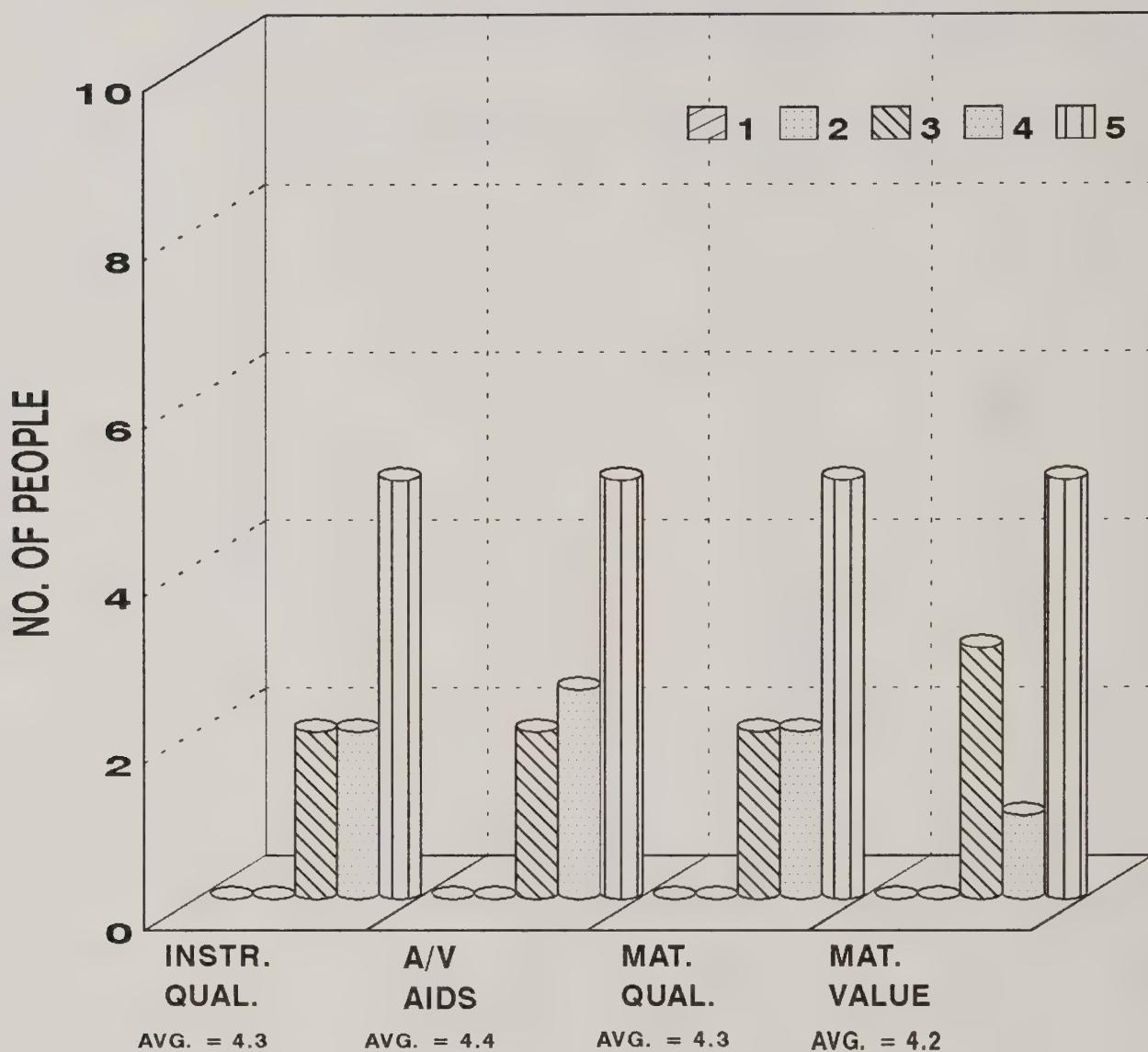
# IV-G HERBICIDE OPERATIONAL CASE STUDIES



## \*\* Written Comments \*\*

- Little value for those east of 100th Meridian
- Good slides. Good coverage of range example.
- Baxter: Good presentation and data of a range project.

## IV-H BIOLOGICAL CONTROL OF EXOTIC SPECIES

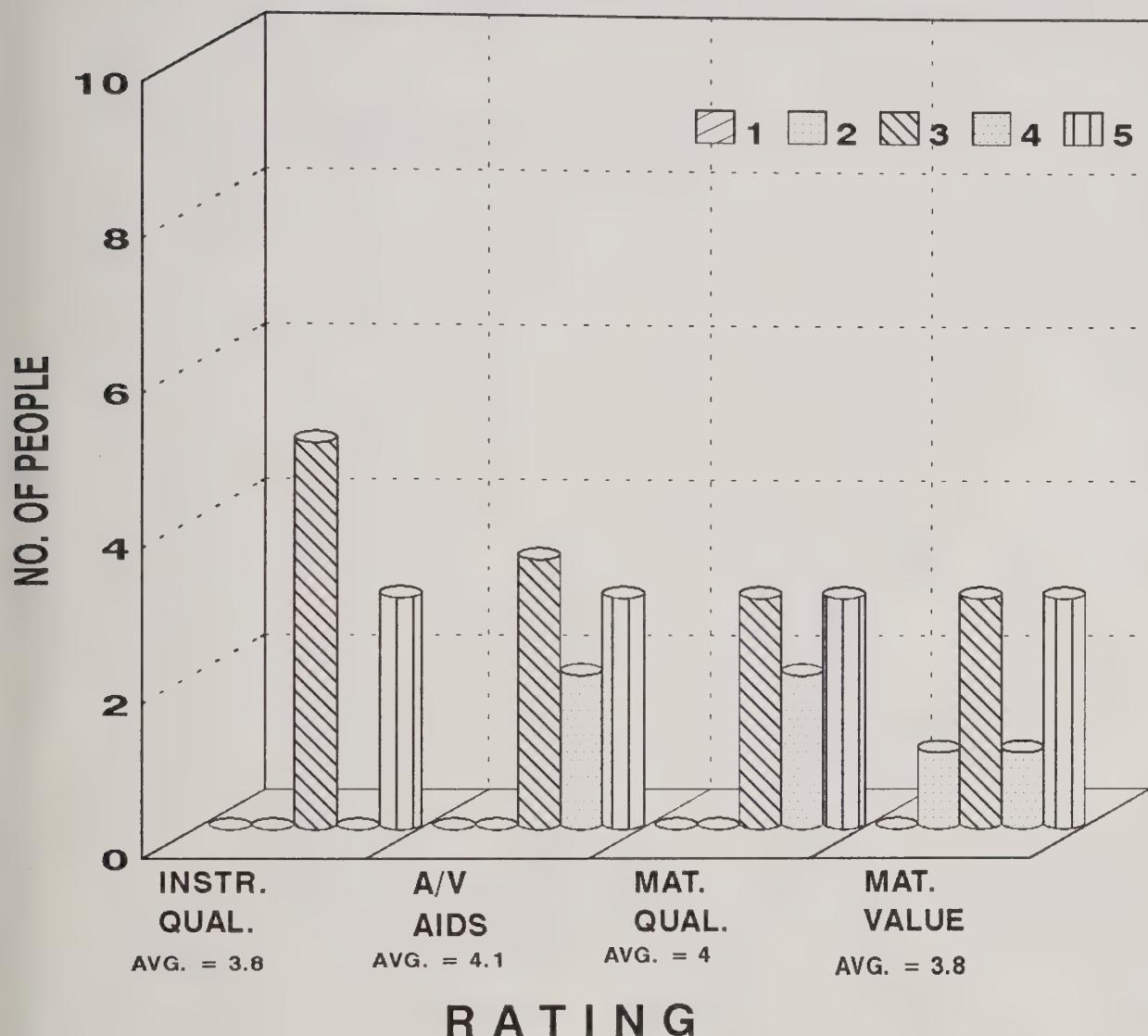


### RATING

#### \*\* Written Comments \*\*

- It is unfortunate that so few students were in attendance for this presentation. This topic needs wider distribution.
- Good answers to questions. Good slides. Good material. Well presented.
- Though I am familiar with biological control concepts, this was an excellent reminder of this process.
- Improve lesson by: handout summarizing concepts, process & contacts nationwide.
- Very interesting presentation.
- Very interesting! Maybe provide more time!

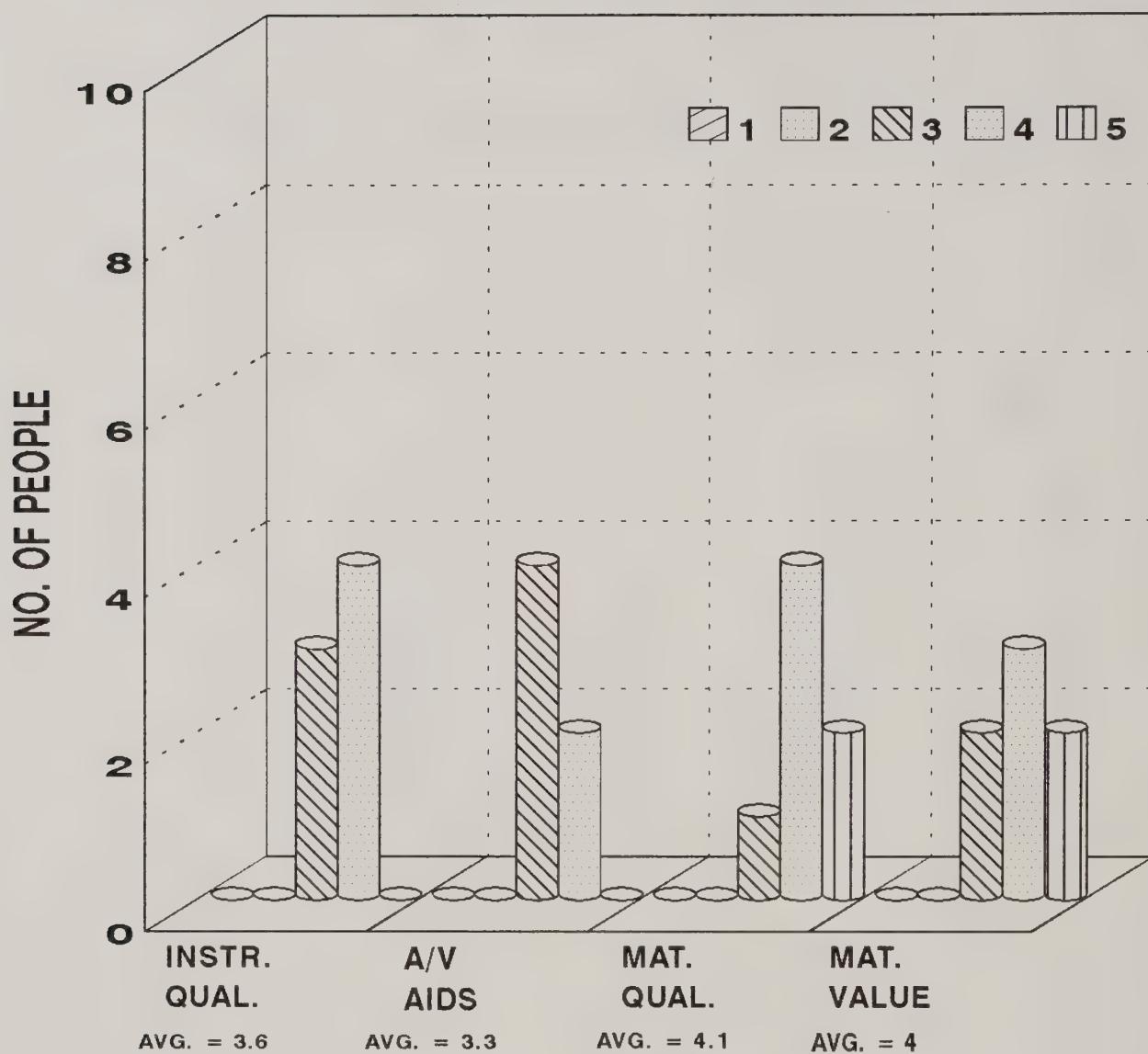
**IV-I FOREST INDUSTRY COOP.  
ENVIRONMENTAL RESEARCH  
WHAT WE KNOW & NEED TO KNOW**



**\*\* Written Comments \*\***

- It's too bad we ran out of time. Very good.
- Should be in common module, measuring pesticides.
- Good stuff.
- Good interaction, good slides, good exercise in having students evaluate or estimate impacts from data.
- Made me aware of my need to communicate more with my regulatory agencies.
- Interesting regulatory interpretation & recommendations.
- Be more focused. Too many points--condense down to just a few recommendations and 2 or 3 conclusions -- 2 or 3 points well presented are better than 10 skipped over quickly.

## IV-J A GUIDE TO MONITORING STREAMWATER QUALITY HOW AND WHEN

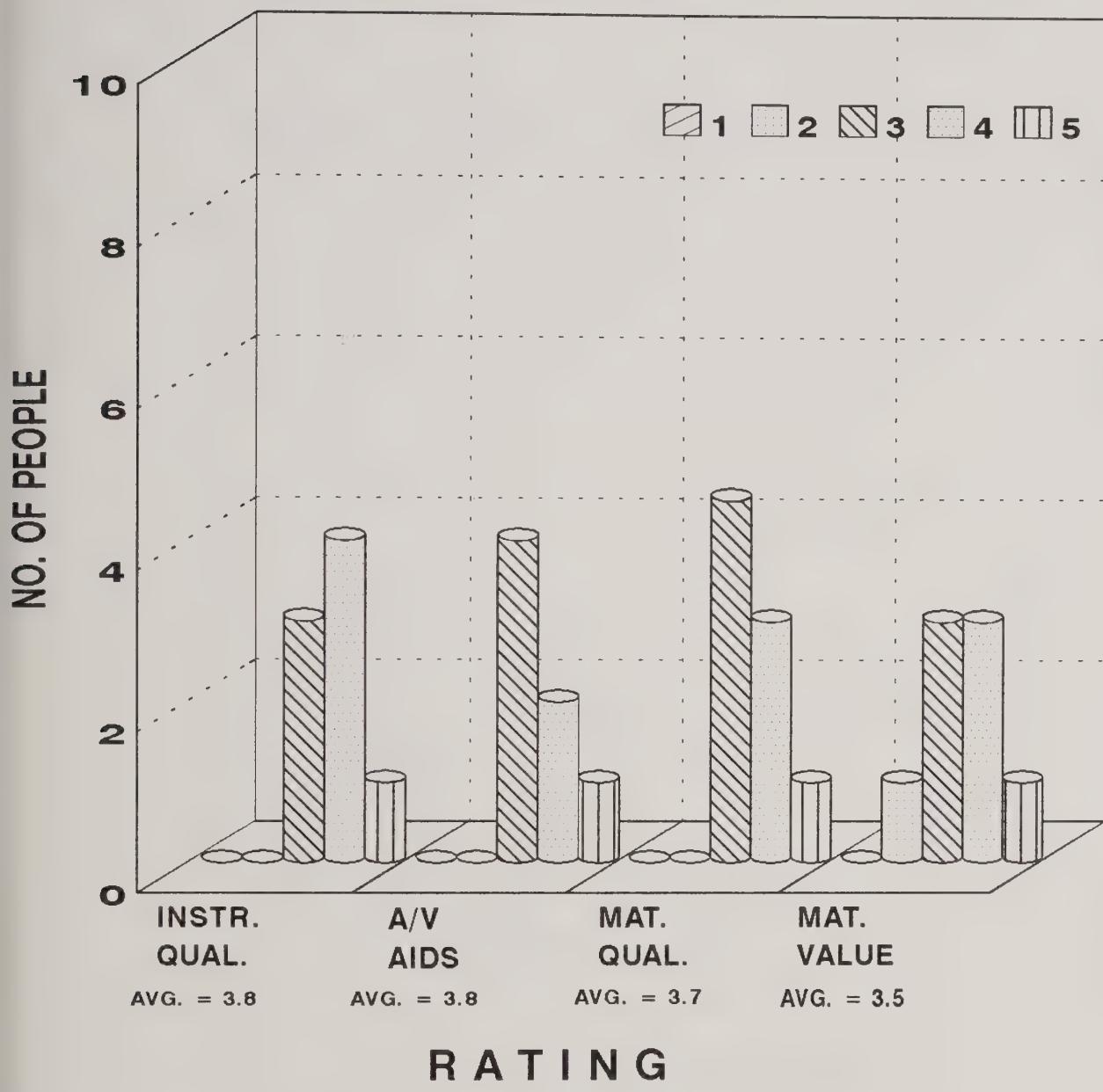


### RATING

#### ***\*\* Written Comments \*\****

- Lecture format & time constraints limits instruction.
- Followed outline material well.
- Good review.
- Lesson needs more time to cover & meet the objective of the lesson.
- Handouts helpful.
- Time management has been poor throughout the course! This topic is important & needs not to be rushed.
  - speakers need to refocus some data. This is not intended to reflect on Ice/Neary.
- Should have been given their full allotment of time.
- Give it more time; this was hurried along too much.

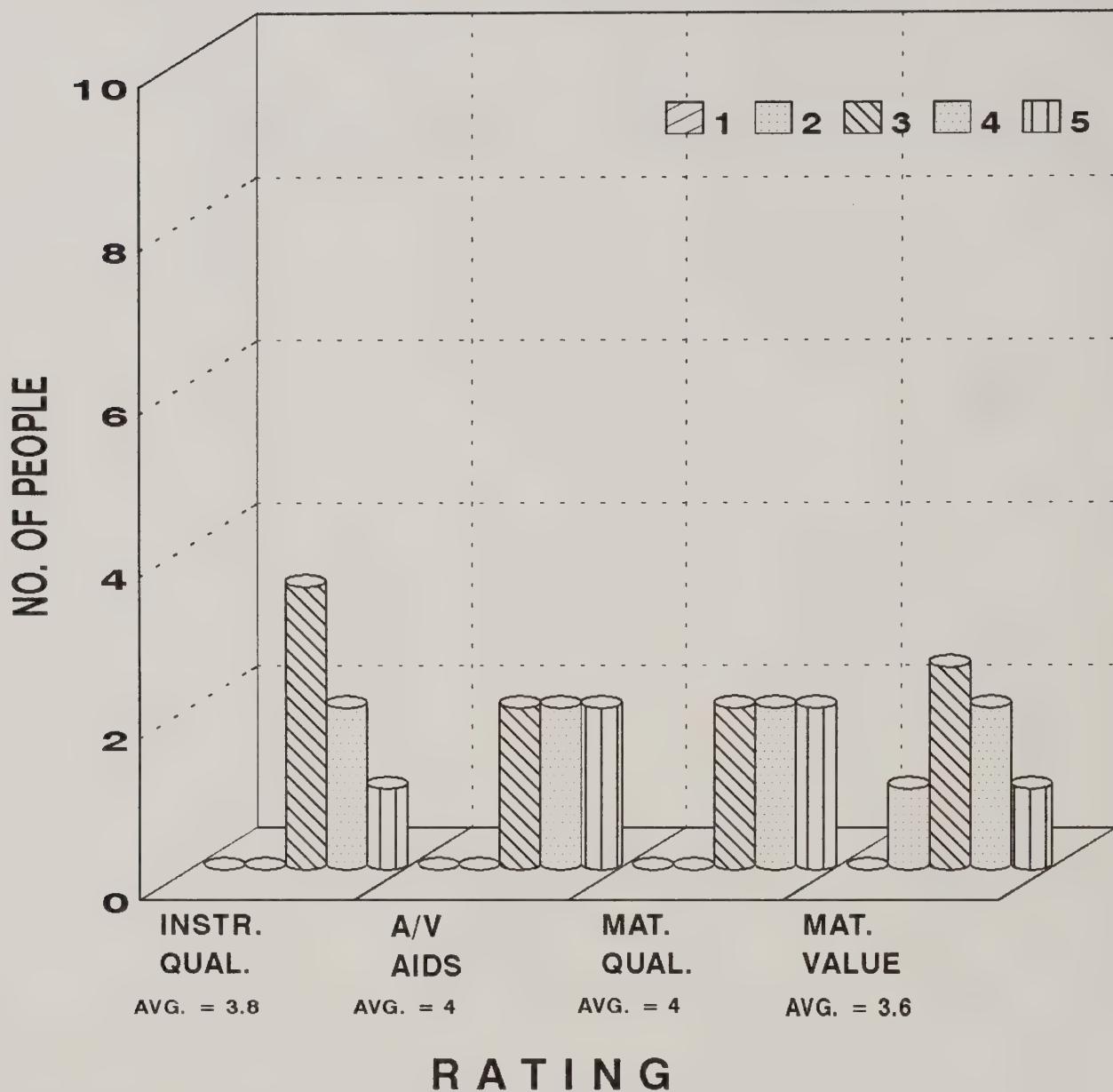
# IV-K BROADCAST APPLICATION EQUIPMENT & TECHNIQUES



## \*\* Written Comments \*\*

- Should be covered in common module.
- Provide list of suppliers.
- Excellent (overall)
- Clear discussion of spray tips, pumps & system.
- Video tape a good example of application methods.
- Quality good but not necessary (lesson objectives).
- Repetition of info from another module.

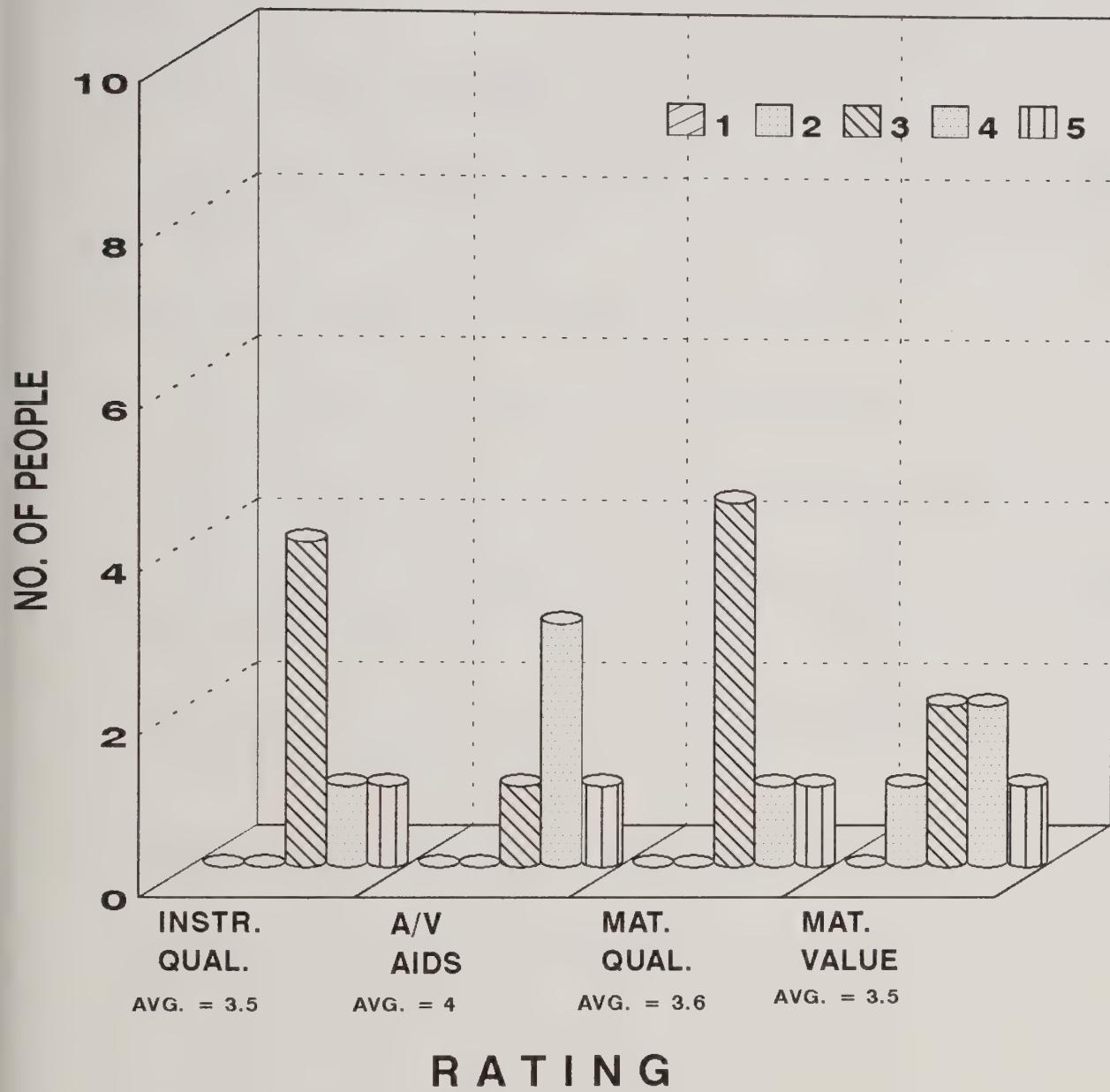
## IV-L CALIBRATION PRINCIPLE AND PROCEDURES



### \*\* Written Comments \*\*

- Should be covered in common module.
- Good slides.
- Good coverage, could be summarized more.
- Summarize more as lesson is repetitive from an earlier model.

## IV-M EXERCISE WITH GROUND EQUIPMENT



### \*\* Written Comments \*\*

- Personal bias on equipment by one instructor was nonproductive.
- Good demonstrations though somewhat remedial.
- Good display of the array of equipment available.
- Most of the topics were covered in other modules.
- More of the instructors should realize that most of the students had already gone through similar exercises in an earlier module--like Dave Thomas did with the aerial discussion. Less in fighting over techniques and equipment would not detract from the information exchange.



## **Recommendations**

Jack Barry's notes upon completion of the March 16-30, 1994 National Pesticide-Use Management Training Course, Marana, AZ.

- Regional commitment and support is essential. This was lacking from some Regions.
- Course leaders must be committed and have time.
- Course leaders should remain for duration of course.
- Best that everyone lodge at Marana but we need private and adequate rooms.
- Instructors need to attend faculty meeting so they follow NARTC guidelines and understand system. If not, they need to come at least two days before their presentation to tune lesson and get the "lay of the land."
- Module leaders need to work very closely with instructors so lesson plans and handouts are prepared on schedule.
- Many instructors still have poor slides or none at all.
- NARTC staff is doing an outstanding job.
- I believe the Russian students gained a lot from course.
- NARTC will mail out certificates of training.
- Course needs more hands-on activities - too little and we have always known that this is important.
- Module leaders need more training in following NARTC guidelines.
- Few instructors left enough time for questions.
- Module idea good but students should attend all modules.

## Appendices

- A - Training Call Letter
- B - Course Brochure
- C - Continuing Education Credit Memo
- D - Course Schedule
- E - National Advanced Resource Technology  
Center Information
- F - Notes of the Faculty Planning Meeting
- G - Faculty Roster
- H - Student Roster
- I - Correspondence
- J - Invitation to Russia
- K - Tee Jet Spray Products On-Site Training
- L - A Visit From Russia

Appendix A

Training Call Letter



United States  
Department of  
Agriculture

Forest  
Service

Washington  
Office

14th & Independence SW  
P.O. Box 96090  
Washington, DC 20090-6090  
(202) 205-1600

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Reply to: 2150

Date: October 5, 1993

Subject: National Pesticide-Use Management Training

To: Regional Foresters, Station Directors, and Area Director

REPLY DUE NOVEMBER 5

Forest Pest Management announces its fourth National Pesticide-Use Management Training course to be conducted March 14-31, 1994, at the National Advanced Resources Technology Center (NARTC), Marana, Arizona. You are requested to respond with nominees of Forest Service and State cooperators by November 5.

The goal of the course is to provide a forum for pesticide-use management information and technology transfer to USDA Forest Service scientists and foresters, State and Federal cooperators, and international partners. Upon successful completion of the course, the attendees will be updated on management and practices of pesticide uses in forestry.

The course is designed to prepare forest level professional silviculturists, range conservationists, entomologists, pesticide coordinators, and managers whose current or future assignment involves or will involve coordinating and managing pesticide-use training and pesticide-use projects. The scope of the course will not include pesticide use in nurseries or greenhouses.

The 1994 course will be presented in four modules - Insecticide, ICS for Managing Pesticide Projects, Common Subjects, and Herbicide. Students may elect one or all modules. In selecting the steering committee's module approach we can maintain the high standards of this national course while controlling costs and focus the training on specific subject areas.

Subjects within each module are listed:

Insecticide Module (4 days.)

Overview of Insecticide Use.

Role of Pesticides in Ecosystem Management (Panel).

Insecticide Classification.

Adjuvants.

Semiochemicals and Strategies.

Spray Behavior, Physics and Modeling.

Operational Case Studies.

Hand Held and Ground Equipment.

Spray Aircraft.

Spray Systems.

Incident Command System Module For Managing Pesticide Projects (1 day).

Introduction, Background, and Purpose of ICS.

Five Major Functions.

ICS Operating Requirements.

ICS Components.

Common Subject Module (3 days).

Pesticide Use Decision Process.

Environmental Protection:

- Threaten, Endangered, and Sensitive Species and Pesticide Use .
- Good Laboratory Practices.
- Environmental Fate of Pesticides.
- Toxic Waste Management.

Risk Assessment:

- Risk Assessment and Toxicology.
- Risk/Hazard Communication.
- Human Exposure.
- Worker Protection Standards.
- Safety Equipment.

Pesticide Delivery:

- Spray Drift Reduction Techniques.
- Spray Equipment Calibration.
- Spray Equipment Characterization.

Herbicide Module (2 days).

Forest and Range Herbicides.

Role of Herbicides in Ecosystem Management (Panel).

Global Use of Herbicides in Forest Use Management.

Ground Equipment and Techniques.

Short/Long Term Effects of Herbicide Use (West, Intermountain, and East).

Biological Control of Weeds.

Forest Industry Cooperative Environmental Research.

Water Monitoring and Immunoassay Techniques.

Herbicide-Use Case Studies.

In addition to your nomination of Forest Service and State cooperators, the Washington Office plans to extend an invitation to the following:

Other Agencies - BIA, BLM, APHIS, NPS, EPA, DOD, and U.S. Agency for International Development.

International - Brazil, Canada, China, Israel, Mexico, New Zealand, and Russia.

There is no course tuition; however, students' parent organizations pay for student travel and per diem costs.

Nominations should be sent to Director, National Advanced Resource Technology Center (Pesticide Course), Pinal Air Park, Marana, Arizona, 85653; telephone number (602) 670-6414. Nominees will be notified of selection by December 10.

Questions should be directed to the course chairperson, John W. Barry, 2121C Second Street, Davis, California, 95616; telephone number (916) 551-1715 or Data General J.Barry:R05H; or FAX (916) 757-8383.

/s/ MICHAEL T. RAINS  
MICHAEL T. RAINS  
Acting Deputy Chief

cc:  
Director, NARTC  
Deputy Chief, WO-IF  
Roger Corner, NARTC  
Jack Barry, FPM-Davis, California  
Julie Weatherby, FPM, Boise Field Office  
Ed Monnig, R1-FPM  
Jesus Cota, WO-FPM  
Dave Thomas, WO-FPM  
Jim D. Brown, R8-FPM

FPM:J.Cota:lt:10/04/93:205-1600



## Appendix B

### Course Brochure



**NATIONAL PESTICIDE  
USE MANAGEMENT  
TRAINING**



March 15 - 30, 1994

**Student Information Section**

Name of Nominee: \_\_\_\_\_

Working Title: \_\_\_\_\_

Agency: \_\_\_\_\_

Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_

DG Address: \_\_\_\_\_

Computer Familiarity: PC \_\_\_\_ DG \_\_\_\_ Both \_\_\_\_

**Submitting Office Section** [REDACTED]

Submitting Office: \_\_\_\_\_

Submitting Office Contact: \_\_\_\_\_

Address: \_\_\_\_\_

Priority #: \_\_\_\_\_  
*Priority #1 is the highest. Prioritize all nominees submitted.*

**National Pesticide Use Management  
Training**

**Course Schedule**

**March**

- |    |   |
|----|---|
| 15 | Travel day for Insecticide Module   |
| 16 | Insecticide Module  |
| 17 | Insecticide Module  |
| 18 | Insecticide Module  |
| 19 | Saturday - Off  |
| 20 | Sunday - Travel Day for Herbicide Module if participating in ICS and Calibration ICS Module (Travel Day for Herbicide Module if participating in Calibration) |
| 21 | Calibration and Characterization (Travel day for Herbicide Module)  |
| 22 | Common Subject Module - Decision Process  |
| 23 | Common Subject Module - Risk Assessment   |
| 24 | Common Subject Module [a.m.] - Herbicide Module [p.m.] (Return travel for Insecticide Module)   |
| 25 | Saturday and Sunday - Off   |
| 26 | Herbicide Module  |
| 27 | Herbicide Module  |
| 28 | Return travel for Herbicide Module  |

**March 15 - 30, 1994**

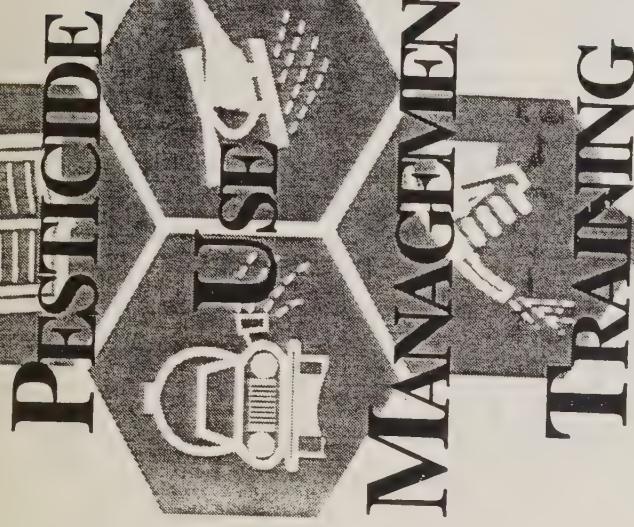
For information contact:

**DIRECTOR**  
National Advanced Resource Technology Center

Pinal Air Park, Marana, AZ 85653  
(602) 670-6414 DG: NARTC: WØ6A  
FAX: (602) 670-6413



**NATIONAL  
PESTICIDE  
USE MANAGEMENT  
TRAINING**



# National Pesticide Use Management Training

## Course Goal

To provide a forum for pesticide-use management information and technology transfer to USDA Forest Service scientists, foresters, State and Federal cooperators, and international partners.

## Course Objective

Upon successful completion of the course, the attendees will be updated on management and practices of forestry-use pesticides to manage forest and range pests.

## Course Description

This course is designed to update land management professionals who coordinate, plan, and manage pesticide-use projects and activities, on current issues and state-of-the-art methods of safe and effective use of pesticides.

The 1994 course will be divided into four modules of instruction, an Insecticide Module, an Incident Command System Module, a Common Subject Module, and an Herbicide Module. Students may attend one or more modules. Students will be given classroom instruction, and practical and field exercises to enhance and make their learning experiences more interesting. Reference materials covering appropriate pesticides, pesticide application, and environmental monitoring will be provided for the student's retention.

## Target Group

Pesticide Coordinators from Forest Service Regional Offices, the Northeast Area (NA), and Experiment Stations; others include: silviculturists, hydrologists, range conservationists and IPM specialists; entomologists and pathologists from Forest Pest Management and

## Cost

There is no tuition charge. Cost of the training to the unit involves per diem, salary, and travel. Lodging and meals available at Pinal Air Park are well within standard per diem allowance.

## Prerequisites

Priority will be given to USDA Forest Service employees whose current or future assignments involve responsibilities for coordinating and managing pesticide-use planning, training, and operations nationally or internationally. Students are expected to have sufficient knowledge of the principles of pesticide application and be motivated to attend training.

## Module Objectives

### Module I - Insecticide

To review and provide students updates on use, types, and developments in forestry use pesticides.

### Module II - Incident Command System (ICS)

To introduce students to the ICS system - how to plan, organize, manage, and direct pesticide application projects using ICS.

### Module III - Common Subject

To update students on national and international issues on pesticide use and practices to include environmental protection, human health, pesticide equipment, forest health, and ecosystem.

### Module IV - Herbicide

To review herbicide use, availability, policy and practices on national forest and range lands.

### Module V - Course Evaluation

To compile a written critique of the course based upon observations, NARTC comments, and student/faculty evaluations for future course improvement.

## Nominations

Tear off the end portion and fill in information on the back for nominations. Nominations are due November 1, 1993. **Nominate only one person per sheet.**

Forest Service nominations to be submitted through Regional Offices, Area Offices, or Stations directly to NARTC.  
Bureau of Land Management nominations shall be submitted through the State Office directly to NARTC.

All other Federal Agencies will nominate through Regional Area Offices to the appropriate National Office level division, who will submit the list of nominees to NARTC.

Non-Federal nominations should be submitted through the appropriate State and Private Representative of the Forest Service.  
Nominations must include the name, work address, telephone number, working title, and agency the nominee represents.

**Nominations Due**  
November 1, 1993  
**Notifications of Selection**  
December 1, 1993

Mail to:

National Advanced Resource Technology Center  
Pinal Air Park, Marana, AZ 85653

## Appendix C

### Continuing Education Credit Memo



MESSAGE DISPLAY FOR JACK BARRY

To D.Hall:R05F16D52A  
T M.Rutty:R05F16A  
J Schmechel:R05F16D54A  
To J.Sherlock:R05F16D51A  
CC J.Barry:R05H

From: John E. Borrecco:R05A  
Postmark: May 23,94 10:31 AM Delivered: May 23,94 10:33 AM

Subject: Continuing Education Credit

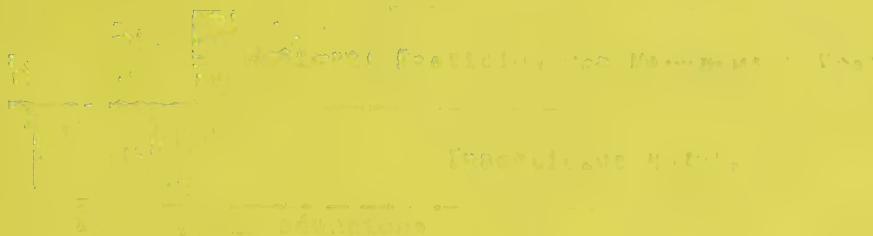
Message:

Dennis, Mike, and John you received 4.5 hrs of Laws, 13 hrs of Ground, 10 hrs of Aerial, and 44 hrs of other for a total of 71.5 hrs. Joe you received 4.0 hrs of laws, 8 hrs of Ground, 6 hrs of Aerial, and 30 hrs of other for a total of 48 hrs. The identification code is A-328-94. I will forward this information to the CECPM for including in your records.

-----X-----



# Practical Application of Pesticides



## Appendix D

### **Course Schedule**

1.6 Place of Insecticide use (Ground and aquatic)

1.7 Pesticide Selection (EPA Channel Discussion)

(Cord Luskard - held 2/11/97)  
2/13/97

1.8 Pesticide Distribution

1.9 Pesticide Classification and Properties

1.10 Pesticide Safety

LUNCH

1.11 Pesticide Control

1.12 Pesticide Labels and Data

1.13 Adhesive used with Pesticides

1.14 Control of Pest Problems

1.15 Control of Pest Problems



NATIONAL ADVANCED RESOURCE TECHNOLOGY CENTER  
 (Revised 12 January 1994)

National Pesticide Use Management Training

Wednesday 03/16/94	Insecticide Module I
0800	Welcome, Introductions  Jack Barry, Jesus Cota Roger Corner/Julie Weatherby
0830	I - A History of Insecticide Use in North American Forestry (ground and aerial)  Richard Fowler
0930	I - B Role of Insecticide Use in Ecosystem Management (Panel Discussion)  (Gene Lessard, Ladd Livingston, ?) * P A N E L * Richard Fowler (Moderator)
1100	I - C1 New Directions in Pesticide Useage  Margaret Jones
1115	I - C2 Insecticide Classification, Modes of Action and Properties  Robert Sanderson
1200	LUNCH
1300	I - C2 -continued
1400	I - C3 Pesticide Labels and Labeling  Margaret Jones
1415	I - D Adjuvants used with Chemical and/or Biological Insecticides  Ellis Huddleston
1500	I - E Semiochemicals  Pat Shea
1530	I - F Semiochemical Strategies  Pat Shea Edward Holsten Ladd Livingston Wayne Berisford
1700	End of Day

NATIONAL ADVANCED RESOURCE TECHNOLOGY CENTER

National Pesticide Use Management Training

Thursday 03/17/94	Insecticide Module I
0800	Pheromone Application Equipment  Diane Herzberg
0900	I - G Spray Behavior, Physics and Modeling
	Pat Skyler William Steinke Harold Thistle
1200	LUNCH
1300	
1500	I - H Insecticide Operational Case Studies
	East - John Ghent West - John Anhold/ Andy Knapp
1700	End of Day

NATIONAL ADVANCED RESOURCE TECHNOLOGY CENTER

National Pesticide Use Management Training

Friday 03/18/94	Insecticide Module
0800	I - K General Configuration of a Spray System  Anthony Jasumback
0830	I - L Nozzles Hydraulic (hollow cones, flat fans, etc.)  Anthony Jasumback
0900	I - M Nozzles Rotary Atomizers (Micronairs & Beecomists)  Anthony Jasumback
1000	I - N Pumps Hydraulic, Piston, Centrifugal, Wind driven, Electric  Pressure Valves, Gauges and Regulators  Keith Windell
1100	I - O Filters Composition, mesh, nozzle, in-line Booms Types, positions, configuration, length  Bill Kilroy
1200	LUNCH
1300	I - I Hand-held and Ground Equipment Backpack sprayers, Hydraulic sprayers, Mistblower, etc. Types, Capacities, Uses, Limitations  Alexander Mangini
1400	I - J Spray Aircraft Fixed Wing / Rotary Wing Makes and Models, Capacities, Uses, Limitations Crop Hawk  Bruce Radsick
1500	I - P Miscellaneous Equipment Navigation Equipment - SATLOC Demonstration Spray Block Marking Equipment and Techniques  Harold Thistle John Goodwin Sam Lagusis Anthony Jasumback Bill Kilroy Harold Flake Bill Jordan
1700	Spray Drift Monitoring Demonstration End of Day

NATIONAL ADVANCED RESOURCE TECHNOLOGY CENTER

National Pesticide Use Management Training

Monday 03/21/94	Incident Command System (ICS) Module II	
0800	II - A Incident Command System History Features Principles and applications	Terrance Haney
1000	II - B Planned Event Incident (Pesticide application projects) Features	Jim Hadfield
1100	II - C Pesticide Project Activities, ICS Functions and project position responsibilites - doing projects with ICS	Steve Howes
1200	LUNCH	
1300	II - C Continued	Steve Howes
1330	II - D Actions needed to set up ICS Pesticide Project teams	Jim Hadfield
1400	II - E Case Histories - Pesticide Project Organizations	Bob Adams Jim Hadfield Steve Howes
1500	II - F Class Exercise	Terrance Haney Jim Hadfield Steve Howes
1700	End of Day	

NATIONAL ADVANCED RESOURCE TECHNOLOGY CENTER

National Pesticide Use Management Training

Tuesday  
03/22/94

Common Module III

0800

III - N Calibration Procedures  
(Ground and Aerial)

0900

Excerises with 2 mock systems

1130

Class Presentations of Calibration Exercises

Julie Weatherby  
John Anhold

1200

LUNCH

1300

III - Q Characterization Procedures  
(Aerial)

1400

Manual Characterization Exercises

1445

Class Presentations of Characterization Exercises

Tim McConnell  
Andy Knapp

1500

III - R Swath Kit Exercises

Amy Onken

1700

End of Day

Half the class follows above schedule. The other half participates in characterization in the AM and Calibration in the PM.

## NATIONAL ADVANCED RESOURCE TECHNOLOGY CENTER

## National Pesticide Use Management Training

Wednesday 03/23/94	Common Subject Module III	
0800	Welcome, Introductions	Jack Barry Jim Brown/Roger Corner
0830	III - A Introduction to Decision Process: NEPA and Public Involvement	Kathie Hauser
1000	A1 Biological Analysis	Julie Weatherby
1130	A2 Economic Analysis	Tom Gregg
1200	LUNCH	
1300	A3 Social/Political Analysis	Susan Yonts- Shepard
1400	III - B Risk Assessment and Toxicology Overview	Ed Monnig
1500	III - C Risk Communications	Charlie McMahon
1600	III - D Threatened, Endangered, Sensitive Species and Pesticide Use	Margaret Jones
1700	End of Day	

## NATIONAL ADVANCED RESOURCE TECHNOLOGY CENTER

## National Pesticide Use Management Training

Thursday 03/24/94	Common Subject Module III	
0800	III - E Human Exposure / Personnel Protection	Jim Brown
0900	III - F Worker Protection Standards	Jim Brown
1000	III - G International Use of Pesticides  * P A N E L *	Jack Barry (Moderator)
1100	III - H Good Laboratory Practices	Michael Mispagel
1200	LUNCH	
1300	III - I Safety Equipment Demonstration	Larry Wong
1500	III - J Immunoassay Technology for Monitoring Pesticides	Charlie McMahon
1600	III - K Burning Pesticide Treated Forest Vegetation and Wood Products	Charlie McMahon
1700	End of Day	

## National Pesticide Use Management Training

Friday 03/25/94	Common Subject Module III	
0800	III - J Fate of Pesticides Land, Air and Water	John Taylor
0900	III - K Pesticides and Hazardous Waste Management and Disposal	Chuck Stury
1030	III - L Sampling Spray Drift and Air Concentrations	Bill Steinke
1130	III - M Environmental Fate Models  (End of Module III)	John Taylor
1200	LUNCH Herbicide Module IV	
1300	IV - Field Trip to Empire/La Cienega Resource Area (BLM) and Patagonia/ Sonoita Preserve (Nature Conservancy)  The objective of this field trip is to provide the student with real world examples of situations facing resource managers as they attempt to apply ecosystem management principles. In this field trip we will visit two sites. At the first site, which is managed by the BLM, we will discuss management alternatives to address the shift in vegetation species that has occurred with fire suppression and grazing. At the second site, which is managed by the Nature Conservancy, we will view the organization's attempt to restore native species to riparian area using a combination of grazing and herbicide treatment.  Contacts: Grant Drennan BLM, Tucson, AZ Jeff Zeller Nature Conservancy, Patagonia AZ	Ed Monnig
1700	End of Field Trip  (Herbicide to be continued on Monday 28th)	

NATIONAL ADVANCED RESOURCE TECHNOLOGY CENTER

National Pesticide Use Management Training

Monday 03/28/94	Herbicide Module IV	
0800	IV - A Global Use of Herbicides in Forest Management	Shepard Zedaker
0900	IV - B Role of Herbicides in Ecosystem Management	Panel - Gary Fiddler Charlie McMahon Mike Newton Ed Monnig (Moderator)
1030	IV - C Forest-Use Herbicides, Formulations, Adjuvants, New Products and Uses	Mike Newton
1200	LUNCH	
1300	IV - D Range-Use Herbicides, Formulations, Adjuvants New Products and Uses	Tom Whitson
1500	IV - E Selective and Spot Application Equipment and Techniques	Max Williamson
1700	End of Day	

## National Pesticide Use Management Training

Tuesday 03/29/94	Herbicide Module IV	
0800	IV - K Broadcast Application Equipment and Techniques	Tom Whitson
0900	IV - L Calibration Principles and Procedures	Ed Monnig
1000	Exercise with ground equipment	Dave Thomas Ed Monnig Tom Whitson
1130	Class Presentation	Ed Monnig Dave Thomas Max Williamson
1200	LUNCH	
1300	IV - F Short-term / Long-term Effects of Forest-Use Herbicide:	West Coast - Phil McDonald/ Mike Newton
1400		Intermountain West - Ray Boyd
	East of the Great Plains	- Shepard Zedaker
1600	IV - G Herbicide Operational Case Studies	Garth Baxter Max Williamson
1700	End of Day	

NATIONAL ADVANCED RESOURCE TECHNOLOGY CENTER

National Pesticide Use Management Training

Wednesday 03/30/94	Herbicide Module IV
0800	IV - H Biological Control of Exotic Species  Norm Reese
0900	IV - I Forest Industry Cooperative Environmental Research - What We Know and Need to Know  George Ice
1000	IV - J A Guide to Monitoring Streamwater Quality - How and When  George Ice Dan Neary
1100	Bus leaves for Tucson



## Appendix E

### National Advanced Resource Technology Center Information





United States  
Department of  
Agriculture

Forest  
Service

National Advanced Resource Technology Center  
Pinal Air Park  
Marana, Arizona 85653

Reply to: 6140 (3400)

Date: February 1, 1994

Subject: National Pesticide Use Management Training

To: Pesticide Faculty

Enclosed is a Faculty Travel Form to complete for the course. Also enclosed is other pertinent information and a Faculty Information Packet. If there are any corrections, please let us know so the final printing is correct.

Your motel accomodation are quite flexible. You may stay here at Pinal Air Park or make a room reservation in Tucson. There are a block of rooms reserved for Pesticide Students and Faculty at the Inn Suites Hotel at 6201 N. Oracle Road; phone numbers are 1-800-~~554-4533~~ 554-4535 or 1-602-297-8111. We will also be providing bus service to and from the hotel to the training center. If you wish to make reservations please give the Inn Suites the information that you are with the NARTC Pesticide group to get the government rate of \$62./night. If you have any problems with reservations at the Inn Suites please ask for Sharon Hensien, Director of Sales. The Inn Suites will also provide transportation from the airport to the motel.

There are of course many other motel/hotels available in Tucson, but we are only providing bus transportation to our training facility from the Inn Suites. Each morning at 7:00 A.M. a bus will depart the Inn Suites for NARTC. Each evening after the last class (5:15 P.M.) a bus will depart NARTC to return to the Inn Suites.

We would like as many faculty members as possible to attend the 4:30 p.m. Faculty Meeting in classroom 5 on March 15, 1994.

If you have any questions, please contact Roger Corner, DG:R.Corner:W06A, or 1-602-670-6414. We look forward to having you here at NARTC.

*J.E. Roberts*  
JOHN E. ROBERTS, Director  
National Advanced Resource Technology Center

Enclosure



NATIONAL PESTICIDE USE MANAGEMENT TRAINING  
MARCH 16 - 30, 1994  
MARANA, ARIZONA

COURSE SCHEDULE  
TRAVEL INFORMATION

Tuesday, March 15, 1994 - Travel Day for Insecticide Module I

Wednesday, March 16, 1994 - Insecticide Module I

Thursday, March 17, 1994 - Insecticide Module I

Friday, March 18, 1994 - Insecticide Module I

Saturday, March 19, 1994 - OFF

Sunday, March 20, 1994 - Travel Day for Herbicides Module if  
Participating in ICS and Calibration

Monday, March 21, 1994 - ICS Module II (Travel Day for Herbicide Module if  
Participating in Calibration)

Tuesday, March 22, 1994 - Aerial Calibration and Characterization (Travel  
Day for Herbicide Module)

Wednesday, March 23, 1994 - Common Module III - Decision Process

Thursday, March 24, 1994 - Common Module III - Risk Assessment

Friday, March 25, 1994 - Common Module III (AM) - Herbicide Module Field  
Trip (PM) (Return Travel for Insecticide Module)

Saturday/Sunday, March 26-27, 1994 - OFF

Monday, March 28, 1994 - Herbicide Module IV

Travel Information - Continued

Tuesday, March 29, 1994 - Herbicide Module IV

Wednesday, March 30, 1994 - Herbicide Module IV (Return Travel for  
Herbicide Module

NATIONAL PESTICIDE USE MANAGEMENT TRAINING  
MARCH 16 - 30, 1994  
MARANA, ARIZONA

FACULTY RESERVATION FORM

This form must be completed and return no later than MARCH 1, 1994; otherwise, we cannot guarantee transportation and housing.

Print your name as you want it to appear on your nametag:

\_\_\_\_\_  
Your Agency: \_\_\_\_\_

\_\_\_\_\_  
Your Office Address: \_\_\_\_\_  
\_\_\_\_\_

Office Telephone Number: \_\_\_\_\_

HOUSING INFORMATION:

Will you be staying at NARTC?        Yes        No

Check In Date \_\_\_\_\_ Check Out Date \_\_\_\_\_

I WILL / WILL NOT need transportation from Tucson to NARTC. (Circle one)

PAYMENT INFORMATION:

Upon check out, will you be paying with?

Diner's Club Credit Card \_\_\_\_\_ Cash or Personal Check \_\_\_\_\_

TRAVEL ITINERARY:

(Please circle one). Please fill this out even if you are arriving by rent-a-car as we need to leave keys at the front gate for anyone arriving after 6:00 p.m.

I Arrive Tucson/Phoenix

date \_\_\_\_\_ time \_\_\_\_\_ airline \_\_\_\_\_ flight no. \_\_\_\_\_

I Depart Tucson/Phoenix

date \_\_\_\_\_ time \_\_\_\_\_ airline \_\_\_\_\_ flight no. \_\_\_\_\_

MAIL TO: NARTC

Pinal Air Park  
Marana, AZ 85653

For additional information, contact Marv Brown, (Logistics Chief)  
Commercial: (602) 670-6414

NATIONAL PESTICIDE-USE MANAGEMENT TRAINING  
MARCH 16 - 30, 1994  
MARANA, ARIZONA

MODULE OBJECTIVES/LEADERS

Module I - Insecticide    Module Leader - Julie Weatherby

To review and provide student updates on use, types, and developments in forestry use pesticides.

Module II - Incident Command System (ICS)    Module Leader - Jim Hadfield  
Managing pesticide application projects.

To introduce students to the ICS system - how to plan, organize, manage, and direct pesticide application projects using ICS.

Upon completion of this module the students will be able to do the following:

1. Describe the five major organizational elements within ICS and state their functions.
2. Understand the duties of ICS positions.
3. Understand potential of the ICS system to pesticide application project management.
4. Be familiar with Incident Action Planning for a pesticide application project.

Module III - Common and Other Subject    Module Leader - Jim Brown

To update students on national and international issues on pesticide use and practices to include environmental protection, human health, pesticide equipment, forest health, and ecosystem.

Module IV - Herbicide Module    Module Leader - Ed Monnig

To review herbicide use, availability, policy and practices on national forest and range lands.

# PINAL AIR PARK

The National Advanced Resource Technology Center (NARTC), located at Pinal Air Park, Marana, Arizona, is located approximately thirty miles northwest of Tucson.

Pinal Air Park, formally a World War II fighter pilot training base, is operated by Evergreen International. Facilities include a motel, restaurant, lounge, convenience store, swimming pool and tennis courts.

You can expect typical Sonoran Desert climate during your stay. Temperature highs and lows from November to March are usually in the seventies during the day and forties at night. Late spring and summer daytime temperatures can run into the one-hundreds, with fifty to seventy degrees at night. Make sure you bring clothing suited to the time of your visit. You may want to pack athletic clothes, as the wide-open space provides many jogging areas.

If you are a weekend guest, we encourage you to visit nearby Tucson, one of the Southwest's fastest-growing cities. As many as two-thousand newcomers are estimated to relocate to this Sunbelt city per month. Tucson has the flavor of a metropolitan area without forgetting the cultural amenities of its pioneer past. The area abounds with art museums, theaters, restaurants, resorts, and shopping areas. For free visitor information, call or write:

Tucson Convention and Visitors Bureau  
130 S. Scott Avenue  
Tucson, Arizona 85701  
(602) 624-1817

Some visitor information is available at the Center.

# TRANSPORTATION

The National Advanced Resource Technology Center is about an hour's drive northwest of Tucson International Airport on Interstate 10. NARTC's quick access to I-10 makes it easy to take trips to nearby Tucson (30 miles), Phoenix (90 miles), or other destinations.

For faculty meetings, NARTC will not provide transportation to the training center. Faculty will provide their own transportation arrangements.

The airports are served by several domestic and international airlines. Fall and winter are busy times of the year in Tucson and Phoenix, so make reservations early.

If unforeseen flight delays cause you to miss the scheduled NARTC transportation, make an overnight reservation in Tucson and call us with your location and transportation needs at (602) 670-6414. We will pick you up in the morning.

From the Phoenix Sky Harbor Airport you will need to travel on I-10 east (towards Tucson) to the Pinal Air Park Exit 232 (one exit past the Red Rock Exit). From the Tucson International Airport you will need to travel on I-10 west (towards Phoenix) to the Pinal Air Park Exit 232 (one exit past the Marana Exit).

You can use Government or chartered plane to reach the center. Pinal Air Park can accommodate any aircraft and features paved, lighted runways with complete fuel/repair services. Please indicate on the enclosed Registration Form if you will be arriving in this mode.

# RECREATION

Pinal Air Park's proximity to Tucson makes it an ideal area for recreational and cultural activities, if the length of your stay allows time for exploration. A basic map is provided on the reverse side of the Lodging/Meals Information Sheet.

In addition to its city sophistication, Tucson also is home of the two Saguaro National Monuments, Arizona-Sonora Desert Museum and Coronado National Forest. All these areas provide an excellent interpretation of desert life. The Desert Museum features living examples of typical plants and animals.

Did you know that a Saguaro cactus doesn't start to grow its traditional arms until it is seventy-plus years old? You can learn this and more at the Saguaro National Monuments operated by the National Park Service.

The Coronado National Forest is a study in contrasts. A two-hour drive can take you from desert to alpine lands where Mt. Lemmon features skiing in winter (weather permitting). More than thirty campgrounds are located throughout the Forest. Sabino Canyon east of Tucson is a popular spot known for its cool waters.

Other points of interest include Mission San Xavier del Bac south of Tucson; the frontier town of Tombstone where the famous OK Corral gun battle was held; Nogales, Sonora, Mexico for south-of-the-border shopping and sightseeing; and Tucson's many fine shopping areas including the Foothills, Tucson, Park, and El Con Malls.

# LODGING/MEALS

## On-Site Lodging and Meals

Students and faculty stay at the training site for the duration of the course (optional for weekends). Seven-day per week lodging and restaurant services are located at Pinal Air Park. Accommodations are motel-like rooms (two people per room) or houses at a rate of \$29.00, including tax, per person, both with daily maid service. Upon receipt of your Registration/Travel form, NARTC will make reservations for you.

**Bring an alarm clock, as wake-up calls are not provided.**

Meals are served cafeteria-style. The restaurant is open every day for breakfast, lunch and dinner during the following hours. Specific meal times for your group will be covered during the Course Details after you arrive.

Breakfast	6:30-8:00 AM
Lunch	11:00-1:00 PM
Dinner	5:00-6:30 PM

Pinal Air Park (Pinal County) is within the standard per diem rate. Meal prices are based on a three-meal-per-day plan, at a cost of approximately \$19.00 per day, including tax. If you plan less than three meals per day, sign out at the restaurant twenty-four hours in advance, or you could be charged for uneaten meals.

A convenience store is available for souvenirs, snacks and other assorted items.

## Payment

Payment for meals and lodging will be paid at the end of your stay by American Express Credit Card, cash, or check. Personal checks in small amounts can be cashed, (about \$25 maximum).

## Telephones

There are telephones in lodging facilities. Business and pay phones are located throughout the training center and park complex.

NARTC (602) 670-6414  
Business hours are 8:00 AM to 4:30 PM.  
FAX (602) 670-6413

## Mail

Daily mail service is available and should be addressed:

National Advanced Resource Technology Center  
Pinal Air Park  
Marana, Arizona 85653

## Medical Services

Medical, dental and pharmacy services are available at the Marana Community Clinic, phone 682-4111.

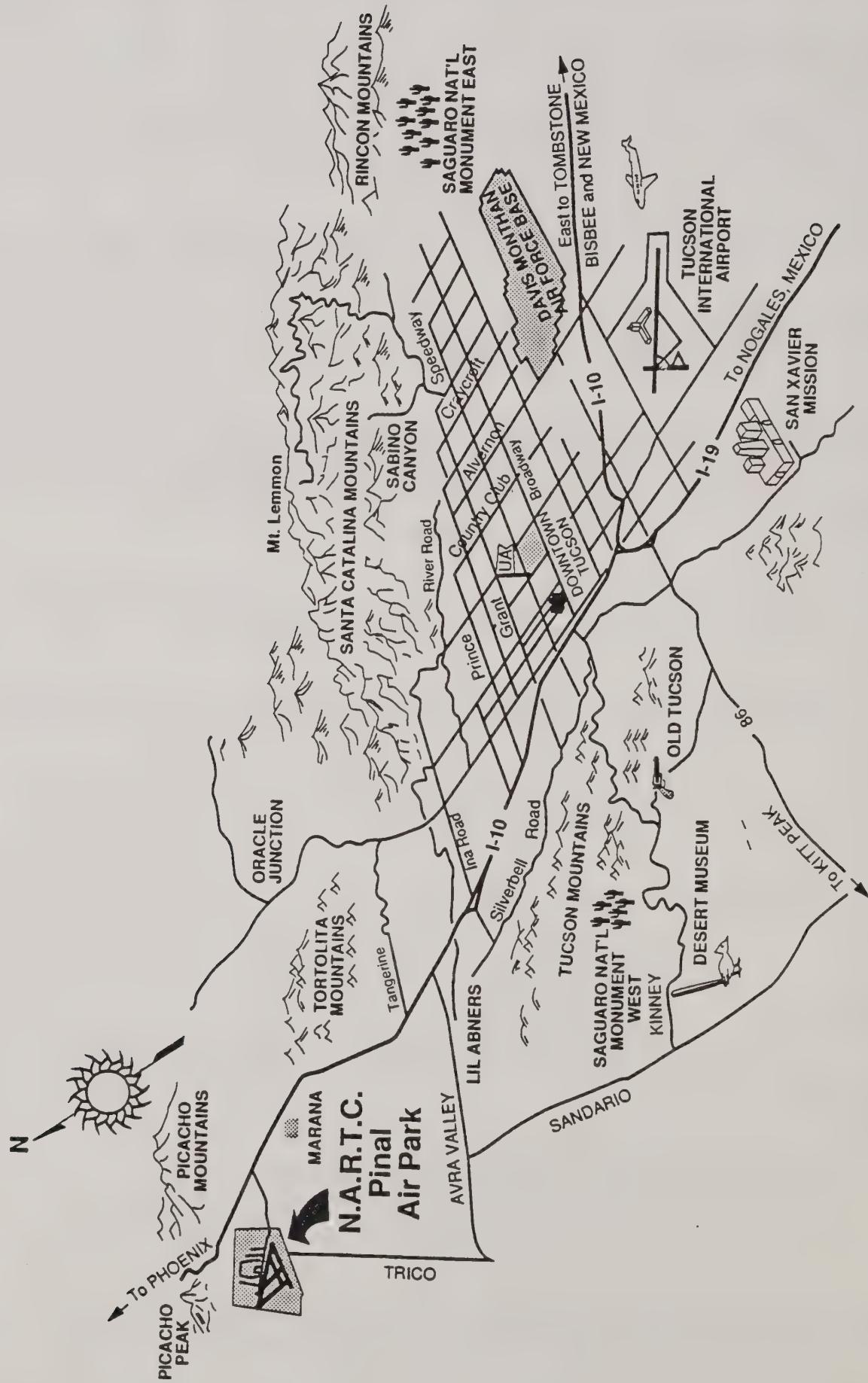
## Miscellaneous Information

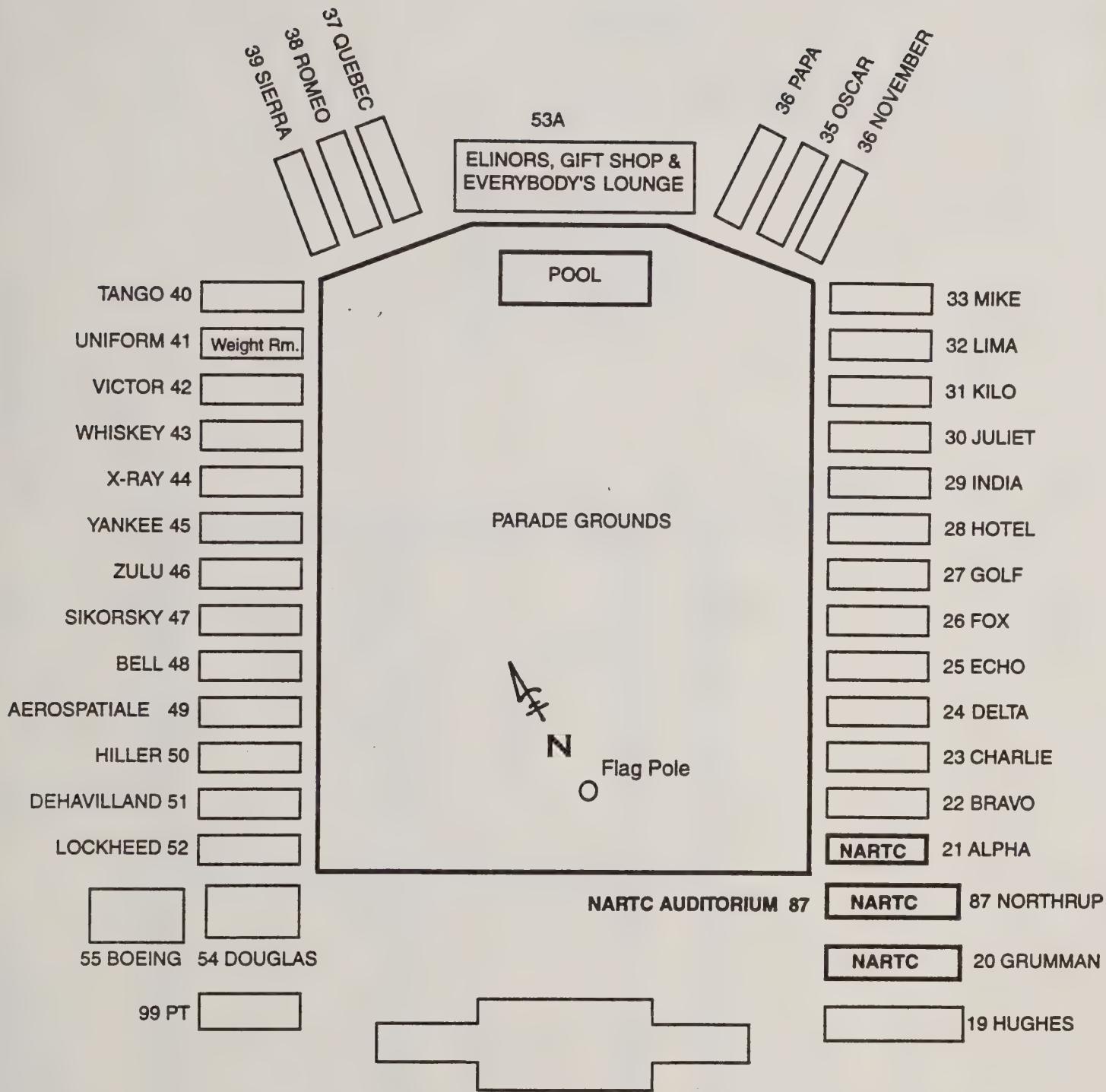
After-Hour and Weekend Emergencies

Outgoing: Dial Zero for Evergreen Operator and indicate the emergency.

Incoming: Dial Evergreen's Operator at (602) 622-3671 and ask for person by name.

If the person cannot be located, ask for the NARTC "Steering Group Chairperson" or a "NARTC Faculty Member".

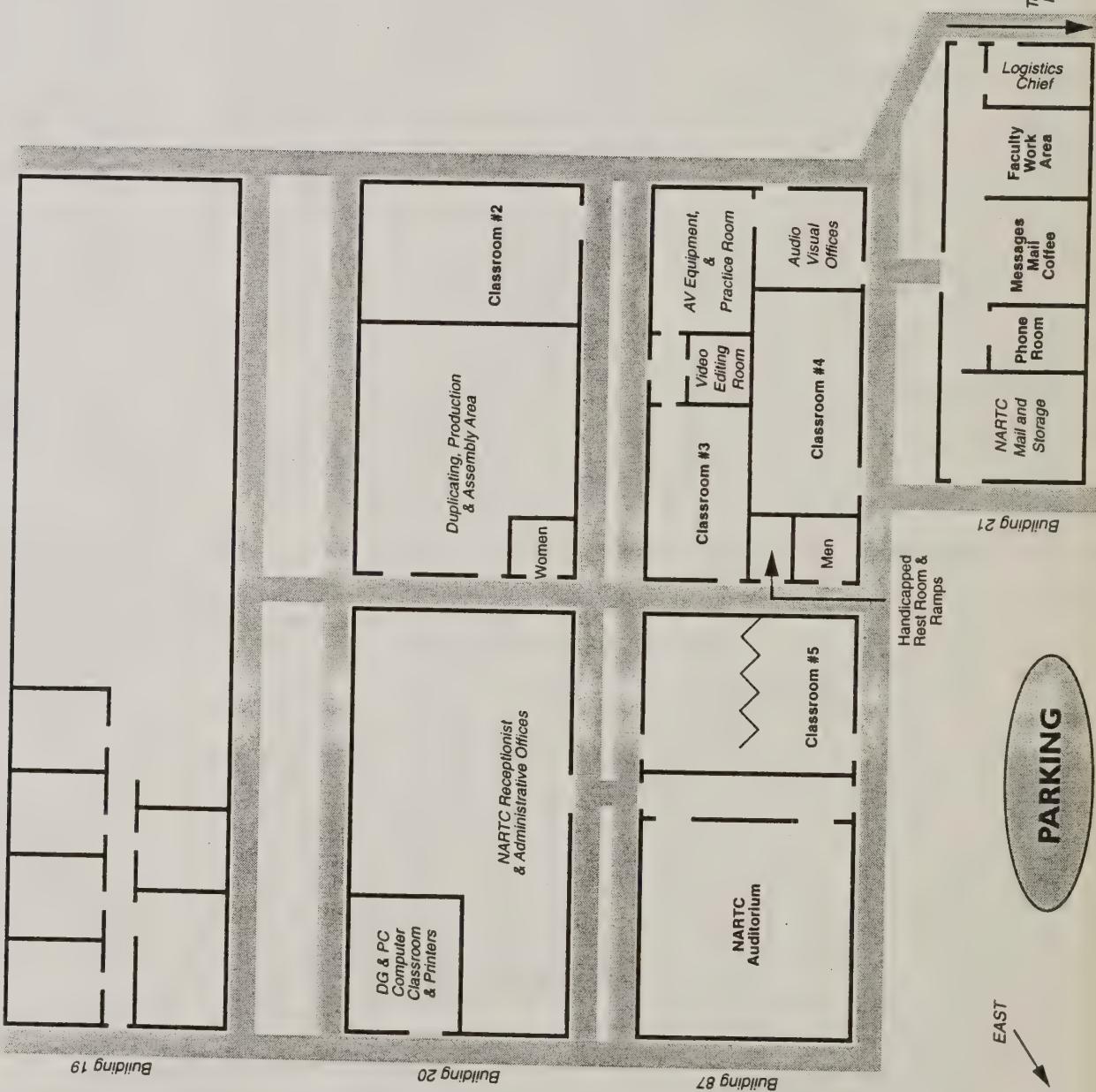




## FACILITIES LAYOUT



## NARTC FACILITIES



## Appendix F

Notes of the Faculty Planning Meeting



United States  
Department of  
Agriculture

Forest  
Service

Washington  
Office

2121 C Second Street  
Davis, CA 95616  
PH (916) 551-1715  
FAX (916) 757-8383

---

Reply To: 2150

Date: October 22, 1993

Subject: Faculty Meeting - National Pesticide-Use  
Management Training Course

To: Steering Committee and Faculty

Thanks to your enthusiasm and teamwork we enjoyed a highly productive meeting at NARTC this week. I have no doubt that the 1994 course will be outstanding. The meeting furthered my resolve that the course is timely given the significant changes in resource management and the recognition of pesticide's roles in ecosystem management. If we ever needed such a course it's now.

The following summarizes our observation, actions, and follow-up activities at NARTC on October 19-21, 1993:

NARTC Staff. We continue to be impressed with the professionalism, services, and enthusiasms of the NARTC staff. We look forward to working with the staff during course production and delivery.

NARTC Facilities. The classroom auditorium and audio visual aids have been up-graded another notch - these were excellent three years ago - now even better with a visualizer, interactive computerized capabilities, and software to support state-of-the-art presentations.

Evergreen/Pinal Air Park Facilities. Federal Law Enforcement Training, State Department, Bureau of Indian Affairs and United States Customs have departed Pinal Air Park; however the facilities e.g. messing, lodging, and air field are still available for our use. The USDA Forest Service intends to remain a tenant at Pinal Air Park. Students and faculty continue to have the option of lodging at Pinal Air Park.

Schedule. Module 1 (Insecticide) will begin on Wednesday, March 16, 1994, with March 15 being a travel day. The course will end with Module III (Herbicide) at noon of March 30 with the afternoon allotted for travel.

Tucson Motel. The faculty concurred with NARTC's recommendation that, for those electing to stay in Tucson, the Best Western Inn Suites, 6201 N. Oracle Rd., Tucson, AZ, (602) 297-8111, will meet our needs. Inn Suites is located only 25 miles from NARTC. The motel is comfortable and will support our needs for student and faculty interactions, and they will accept a tax exempt form.

Transportation. NARTC will provide daily transportation from the Inn Suites to Pinal Air Park. Details will be provided after we obtain final enrollment.

Audio Visual Guidelines. NARTC will draft a booklet with information to help faculty (especially those who didn't attend this week) to understand NARTC's audio visual and classroom capabilities and how to maximize use of these resources.

Marketing. Downsizing and tight budgets, the way of the present and future, present a special challenge to recruiting students. Each of us will need to market this course. We need to use our "salespersonship" to communicate the timeliness and importance of this course. One-on-one contacts with supervisors is an excellent approach.

Nominations. Student nominations are due by November 1; however they may be submitted electronically to NARTC (R.Corner:W06A) by December 15. On that date the Steering Committee and NARTC will review the nominations via DG or telephone. If the number is low we will reevaluate and make a recommendation to Director, FPM.

Budget. The module leaders and myself discussed the course budget with John Roberts (NARTC Director) and Roger Corner. Everyone, including the faculty, is cognizant of the need to keep costs within budget. Each Module Leader presented his/her budget and these were integrated into the NARTC budget for the pesticide course (copy of budget is attached to hard copy of this memo). Jesus Cota, FPM, provided NARTC \$54,000 based upon a preliminary NARTC estimate of what it would cost them to produce the course. The budget is now estimated at \$73,525; therefore another \$19,525 (\$10,000 of which has been verbally allocated by WO) will be needed to support the course. I would like to emphasize that the NARTC and the Module Leaders carefully scrutinized all anticipated expenses, consolidated, identified faculty, and arranged schedules to accommodate economics.

Course Schedule and Faculty Roster. These have been updated as of 10-21-93. Module Leaders - please provide updates to Roger as they develop. Roger will provide updates by Data General. Jack Barry will send copy to Committee, Module Leaders, and Pesticide Coordinators via my "Marana 1994" mailing list.

Critical Dates. This schedule has been updated and Module Leaders have a copy. Please help us keep on schedule.

Faculty/Students. Some faculty will likely want to be students in one or more modules. The steering committee, recognizing economics, encourages this dual role providing that the selected faculty participates fully as a student.

Course/Module Evaluations. Module Leaders will arrange for an evaluation during the course, of their respective module. Roger Corner will advise on NARTC requirements and work with Module Leaders. The steering committee will evaluate the course at the post-course critique using the module evaluations and their own observations.

Ecosystem Management Panels. There will be one panel in the Insecticide Module and another in the Herbicide Module. The objective of the panel is to provide a stimulating discussion with views on role of pesticides in ecosystem management. This role is developing, therefore there are only views and opinions at this time with opportunities for our students to share views.

Course Introduction. Jack Barry will briefly introduce each Module and Module Leader; and review course goals and objectives, background and evaluation of the training program, construction of the course, its timeliness, international cooperation, and sponsors.

Module Leaders. Each will work closely with their instructors to insure timely submission of lesson objectives and plans, alertness to NARTC services and requirements including dress code. Module Leaders are the key people to producing another quality pesticide course.

Recommendation. The steering committee recommended that future national pesticide courses at NARTC be interagency and that interagency partners be on the steering committee. There are several reasons for these recommendations but primarily to promote economics, partnerships, information exchange, and sharing. Roger Corner pointed-out that this is the evolution of the other NARTC courses. This will be discussed by the Steering Committee at the course critique.

Conclusion. As noted this was a highly productive session at NARTC and the steering committee expresses its appreciation to Roger Corner and John Roberts, and their staff for hosting and supporting the faculty.

/s/ JOHN W. BARRY  
JOHN W. BARRY  
Chairperson

Encl. Budget (not on DG version)

cc: J.Cota  
J.Rockett  
J.Roberts  
M.Weiss  
J.Space  
H.Thistle



## Appendix G

### Faculty Roster



## National Pesticide-Use Management Training

### Faculty Roster

John Anhold USDA Forest Service 4746 S. 1900 E. Ogden, UT 84403	801-476-9728 DG: S22L02A Fax: 801-479-1477
Larry Barber USDA Forest Service P.O. Box 2680 Asheville, NC 28802	704-257-4323 S29A Fax: 704-257-4840
Jack Barry USDA Forest Service - WO 2121C Second Street Davis, CA 95616	916-758-4600 DG: R05H Fax: 916-757-8381
Garth Baxter USDA Forest Service, R-4 Forest Pest Management 324 - 25th Street Ogden, UT 84401	801-625-5258 DG: R04A
Wayne Berisford Department of Entomology University of Georgia Athens, GA 30605	706-542-7888
Ray Boyd Forestry Sciences Laboratory 1221 South Main Moscow, ID 83843	208-882-3557

James D. Brown USDA Forest Service, R-8 1220 Peachtree Road, N.W. Atlanta, GA 30367	404-347-2961 DG: R08A Fax: 404-347-1880
Dr. Jesus Cota USDA Forest Service - WO Forest Pest Management P.O. Box 96090 Washington, DC 20090-6090	202-205-1600 DG: W01C 202-205-1139
Harold Flake USDA Forest Service, R-8 Forest Pest Management 1720 Peachtree St., N.W., Rm 925N Atlanta, GA 30367	404-347-2961 DG: R08A
Richard Fowler USDA Forest Service Forest Pest Management P.O. Box 96090 Washington, DC 20090-6090	202-205-1600 DG: W01C 202-205-1139
John Ghent USDA Forest Service, R-8 P.O. Box 2680 Asheville, NC 28802	704-257-4328 DG: S29A 704-257-4840

John Goodwin SATLOC Custom Farm Service P.O. Box 338 Stanfield, AZ 85272	602-424-3322
Tom Gregg USDA Forest Service, R-6 333 S.W. 1st Street Portland, OR 97208	503-326-2728 DG: R06C
Jim Hadfield USDA Forest Service, R-6 333 S.W. 1st Street Portland, OR 97208	503-326-2727 DG: R06C
Terrance Haney 5943 Solamea Ave. Woodland Hills, CA 91367	818-888-1423 Fax: 818-888-2546
Kathie Hauser USDA Forest Service, R-4 324 25th Street Ogden, UT 84401	801-625-5897 DG: R04A
Diane Herzberg USDA Forest Service, MTDC Ft. Missoula, Bldg. #1 Missoula, MT 59801	406-329-3957 DG: R01A 406-329-3719
Dr. Edward Holsten USDA Forest Service 201 E. 9th Avenue Anchorage, AK 99501	907-271-2575 DG: R10F04A

Steve Howes Wallowa-Whitman NF Box 907 Baker City, OR 97814	503-523-6391 DG: R06F16A
Dr. Ellis Huddleston Dept. Of Entomology, Pathology, & Weed Science New Mexico State University Las Cruces, NM 88003	505-646-3934 Fax: 505-646-5975
Dr. George Ice NCASI P.O. Box 458 Corvallis, OR 97339	503-752-8801
Anthony Jasumback USDA Forest Service, MTDC Ft. Missoula, Bldg. #1 Missoula, MT 59801	406-329-3922 DG: R01A 406-329-3719
Margaret Jones US EPA, R-5 77 W. Jackson Blvd. SP-14J Chicago, IL 60604	312-353-5790 Fax: 312-353-4342
Dr. Bill Jorden P.O. Box 36373 Tucson, AZ 85740	602-297-4017
Bill Kilroy USDA Forest Service - MTDC Ft. Missoula, Bldg. #1 Missoula, MT 59801	406-329-3925 DG: R01A

Andy Knapp  
USDA Forest Service, FPM  
1750 Front Street, Rm 202  
Boise, ID 83702

208-364-4222  
DG: R04F02A  
Fax: 208-364-4111

Gene Lessard  
USDA Forest Service  
Forest Pest Management  
P.O. Box 96090  
Washington, DC 20090-6090

202-205-1600  
DG: W01C  
Fax: 202-205-1139

Dr. R. Ladd Livingston  
Idaho Dept. Of Lands  
P.O. Box 670  
Coeur d'Alene, ID 83814

208-769-1525  
DG: IDL.BPF:R01F04A  
Fax: 208-664-3840

David McCauley  
USDA Forest Service, R-5  
630 Sansome St.  
San Francisco, CA 94111

510-825-9800

Timothy McConnell  
USDA Forest Service, R-1  
P.O. Box 7669  
Missoula, MT 59807

406-329-3605  
DG: R01A  
Fax: 406-329-3347

Phil McDonald  
USDA Forest Service  
2400 Washington Avenue  
Redding, CA 96001

916-246-5455

Charles McMahon  
G.W. Andrews Forestry Sciences Lab  
Devall Street  
Auburn University, AL 36849

205-887-4518  
DG: S30A

Dr. Alexander Mangini USDA Forest Service, FPM 2500 Shreveport Hwy. Pineville, LA 71360	318-473-7286 DG: R08F06A
Dr. Michael Mispagel College of Veterinary Medicine Dean's Office University of Georgia Athens, GA 30602	706-542-5875
Ed Monnig USDA Forest Service, R-1 Federal Building P.O. Box 7669 Missoula, MT 59807	406-329-3134 DG: R01A
Dr. Dan Neary USDA Forest Service Southwest Forest Science Complex 2500 S. Pine Knoll Flagstaff, AZ 86001	520-556-2176 DG: S28L02A
Dr. Mike Newton School of Forestry Oregon State University Corvallis, OR 97331	503-737-6076
Amy Onken Forest Health Protection 180 Canfield Street Morganfield, WV 26505	304-285-1565 DG: S24L08A Fax: 304-285-1505
Dr. Norm Reese USDA, ARS, RWL 402 Culbertson Hall Montana State University Bozeman, MT 59717-0056	406-994-6405

Dr. Robert Sanderson Dept. Of Entomology, Pathology & Weed Science New Mexico State University Las Cruces, NM 88003	505-646-3543  Fax: 505-646-5975
Dr. Patrick Shea USDA Forest Service, PSW 2121C Second Street Davis, CA 95616	916-758-4600 DG: R05H 916-757-8381
Pat Skyler USDA Forest Service, FPM 2121C Second Street Davis, CA 95616	916-758-4600 DG: R05H 916-757-8381
Dr. William Steinke Agricultural Engineering Extension University of California Davis, CA 95616	916-752-1613  Fax: 916-752-2640
Chuck Stury Coronado National Forest 300 West Congress Tucson, AZ 85701	602-670-5448
Dr. John Taylor USDA Forest Service, R-8 Forest Pest Management 1720 Peachtree Road, N.W. Atlanta, GA 30367	404-347-2718 DG: J.W.Taylor:R08A
Dr. Harold Thistle USDA Forest Service, MTDC Ft. Missoula, Bldg. #1 Missoula, MT 59801	406-329-3981 DG: R01A Fax: 406-329-3719

Dave Thomas USDA Forest Service Forest Pest Management P.O. Box 96090 Washington, DC 20090-6090	202-205-1600 DG: W01C
Dr. Julie Weatherby USDA Forest Service, R-4 Forest Pest Management 1750 Front Street Boise, ID 83702	208-364-4226 DG: R04F02A 208-364-4111
Tom Whitson University of Wyoming Extension Service P.O. Box 3354 Laramie, WY 82071	307-766-3113
Max Williamson P.O. Box 848 Kennesaw, GA 30144	404-668-1571
Lawrence Wong California Dept. Of Health Service 700 Heinz Ave., Ste. 201 Berkeley, CA 94710	415-540-3867
Susan Yonts-Shepard USDA Forest Service - WO P.O. Box 96090 Washington, DC 20090-6090	202-205-1152 DG: W01C
Dr. Shepard Zedaker Virginia Polytechnic Institute College of Forestry 228 Cheatham Hall Blacksburg, VA 24061	703-231-4855

EDUCATIONAL INSTITUTION FOR CHILDREN  
MARCH 1-10, 1990  
SYDNEY, AUSTRALIA

Appendix H

**Student Roster**

EDUCATIONAL INSTITUTION FOR CHILDREN

LAWRENCE DENTON  
1000 E. 12th Street  
Austin, Texas 78701  
(512) 477-5474  
(512) 477-5483

EDUCATIONAL INSTITUTION FOR CHILDREN  
P.O. Box 1000  
Post Office Box 1000  
Austin, TX 78701

EDUCATIONAL INSTITUTION FOR CHILDREN  
P.O. Box 1000  
Post Office Box 1000  
Austin, TX 78701

EDUCATIONAL INSTITUTION FOR CHILDREN  
1000 E. 12th Street  
Austin, Texas 78701  
1000 E. 12th Street  
Austin, Texas 78701

EDUCATIONAL INSTITUTION FOR CHILDREN  
P.O. Box 1000  
Post Office Box 1000  
Austin, TX 78701

EDUCATIONAL INSTITUTION FOR CHILDREN



NATIONAL ADVANCED PESTICIDE COURSE  
MARCH 16-30, 1994  
MARANA, ARIZONA

FINAL STUDENT ROSTER

<u>NAME AND ADDRESS</u>	<u>PHONE/DG</u>	<u>MODULE(S) ATTENDED</u>
BOB ADAMS USDA Forest Service 5 Radnor Corporate Center 100 Matsonford Rd., Ste 200 P.O. Box 6775 Radnor, PA 19087-4585	610-975-4125 DG: S24A	I, II
KURT ALLEN USDA Forest Service, NA P.O. Box 640 Durham, NH 03824	603-868-7718 DG: S24L06A	I, II, III, IV
DEBRA ALLEN-REID USDA Forest Service 180 Canfield Street Morgantown, WV 26505	304-285-1557 DG: S24L08A	I, II, III
MICHAEL ANDERSON USDA Forest Service Rocky Mountain Station 240 W. Prospect Road Fort Collins, CO 80526-2098	303-498-1287 DG: S28A	I, II, III, IV
DARLENE BARRETT USDA Forest Service Asheville Field Office P.O. Box 2680 Asheville, NC 28802	704-257-4320 DG: S29A	I, II, III
GARTH BAXTER USDA Forest Service, R-4 Forest Pest Management 324-25th Street Ogden, UT 84401	801-625-5258 DG: R04A	III, IV
TERRY BIERY 910 AG/DOS 3976 King Graves Road Youngstown-Warren RGL APRT ARS, OH 44473-0910	216-392-1178	I, II, III,
DAVID BLACKBURN Arkansas Plant Board P.O. 1069 Little Rock, AR 72203	501-225-1598	I, III

<u>NAME AND ADDRESS</u>	<u>PHONE/DG</u>	<u>MODULE(S) ATTENDING</u>
JENNIFER BOFINGER New Hampshire Dept. of Resources and Economic Development Division of Forest and Land Box 1856, 172 Pembroke Road Concord, NH 03302-1856	603-271-3629	II, III
DICK BRADBURY Department of Conservation State House Station #22 Augusta, ME 04333	207-287-4982	I
CAPT. DOUG BURKETT 910 AG/DOS 3976 King Graves Road Youngstown-Warren RGL APRT ARS, OH 44473-0910	216-392-1178	III
ROBERT G. BUSTAMENTE USDA Forest Service Monongahela National Forest 200 Sycamore Street Elkins, WV 26241-3902	304-636-1800	I, II, III, IV
CRAIG CHAPMAN Delaware Dept. of Agriculture 2320 S. DuPont Hwy. Dover, DE 19901	302-739-4811	I, II, III
DON CLYMER USDA Forest Service, R-9 Allegheny National Forest 222 Liberty Street Box 847 Warren, PA 16365	814-723-5150 DG: R09F19A	I, II, III, IV
IGNACIO VASQUEZ COLLAZO INIFAP Avenida Latino Americana 1101 Colonia Revolucion Uruapan, Michauacan, Mexico	(452) 40423 Fax: (452) 44095	I, II, III, IV
DAVID COWEN USDA-APHIS Building 1398 Otis ANGB, MA 02542	508-563-9303	I, II, III, IV
MIKE DAVIS USDA Forest Service George Washington N.F. Warm Springs R.D. Route 2, Box 30 Hot Springs, VA 24445	703-839-2521 DG: R08F08D06A	I, II, III, IV

<u>NAME AND ADDRESS</u>	<u>PHONE/DG</u>	<u>MODULE(S) ATTENDING</u>
CLARENCE DUNBAR Indiana DNR Vallonia State Nursery 2782 W. County Rd., 540 South Vallonia, IN 47281	812-358-3621	I, II, III, IV
KAREN FELTON USDA Forest Service 180 Canfield Street Morgantown, WV 26505	304-285-1556 DG: S24L08A	I, II, III
ROBERTA "BOBBIE" FITZGIBBON USDA Forest Service, FH Alexandria Field Office P.O. Box 5500 Pineville, LA 71361	318-473-7286 DG: R08F06A	I, II, III
HAROLD FLAKE USDA Forest Service, R-8 Forest Pest Management 1720 Peachtree St., N.W. Room 925N Atlanta, GA 30367	404-347-2961 DG: R08A	II
MICHELLE FRANK USDA Forest Service Arizona Zone Office SW Forest Science Complex 2500 S. Pineknoll Drive Flagstaff, AZ 86001	602-556-2072 DG: S28L02A	I, II, IV
JAIME BOCANEGRA GALLEGOS Constitucin No. 343 Ciudad Guzmn Julisco, Mexico		I, II, III, IV
JAN HACKER West Virginia Department of Agriculture 1900 Kanawha Blvd., E. Charleston, WV 25305	304-558-2212	I, II, III
JIM HADFIELD USDA Forest Service, R-6 Forest Pest Management P.O. Box 3623 Portland, OR 97208	503-326-2728 DG: R06C	I, II
DENNIS HALL USDA Forest Service, R-5 Stanislaus National Forest Calaveras Ranger District P.O. Box 500 Hathaway Pines, CA 95233	209-795-1381 DG: R05F16D52A	I, II, III, IV

<u>NAME AND ADDRESS</u>	<u>PHONE/DG</u>	<u>MODULE(S) ATTENDING</u>
EILEEN HARVEY Forest Pest Management Institute Box 490 Sault St. Marie, Ontario Canada P6A 5M7	705-759-5740	II, III
CHARLES HATCH USDA Forest Service, NA 5 Radnor Corporate Center, Ste. #200 P.O. Box 6775 Radnor, PA 19087-4585	215-975-4120 DG: S24A	I
DENNIS HAUGEN USDA Forest Service, FHP 1992 Folwell Avenue St. Paul, MN 55108	612-649-5248 DG: S23A	II, III
DIANE HERZBERG USDA Forest Service MTDC Ft. Missoula, Bldg. #1 Missoula, MT 59801	406-329-3957 DG: R01A	I, III
DAVID SCOTT HILL USDA Forest Service, R-3 Gila National Forest Black Range R.D. P.O. Box 431 Truth or Consequences, NM 87901	505-894-6677 DG: R03F06D02A	I, II, III, IV
GAYLE JANSEN Indiana DNR 402 W. Washington St. Room West 290 Indianapolis, IN 46204	317-232-4120	II, III
BILL KILROY USDA Forest Service MTDC Ft. Missoula, Bldg. #1 Missoula, MT 59801	406-329-3925 DG: R01A	I, III
ELENA KULIKOVA Silikathaya St. I8b-IC I4I604 Mytishtchi-4 Moscow Regton, Russia		I, II, III, IV
ROY MAGELSEN USDA Forest Service Forestry Sciences Lab 3200 SW Jefferson Way Corvallis, OR 97331	503-750-7433 DG: S26L05A	I, II, III

<u>NAME AND ADDRESS</u>	<u>PHONE/DG</u>	<u>MODULE(S) ATTENDING</u>
PHILIP MARSHALL Indiana DNR Vallonia State Nursery 2782 W. County Road, 540 South Vallonia, IN 47281	812-358-3621	I, II, III
CYNTHIA MARTINEZ U.S. Fish & Wildlife Service 3616 W. Thomas Road, Suite 6 Phoenix, AZ 85023	602-379-4720	I, II, III, IV
RAMON MURO MONTIEL SARH Avendia Federalismo Sur 415 Sector Juarez Guadalajara, Jalisco CP4410 Mexico		I, II, III, IV
KEVIN NAFFIN USDA Forest Service, R-1 Idaho Panhandle N.F. Sand Point R.D. Sand Point, ID 83864	208-263-5111 DG: R01F04D06A	I, II, III, IV
RICK NEWMON USDA Forest Service, R-3 Lincoln N.F. Cloudcroft R.D. Box 288 Cloudcroft, NM 88317	505-682-2551 DG: R03F08D02A	IV
JOHN OMER USDA Forest Service 180 Canfield Street Morgantown, WV 26505	304-285-1544 DG: S24L08A	I, II, III
DON ROGERS North Carolina Division of Forest Resources 701 Sandford Drive Morganton, NC 28655	704-438-6270	I, II, III
ANDREY RASPOPOV Teply Stan St., 5 NOKP.2, 45 Moscow, Russia 117465		I, II, III, IV
MICHAEL J. RUTTY USDA Forest Service, R-5 Stanislaus National Forest 19777 Greenley Road Sonora, CA 95370	209-532-3671 x285 DG: R05F16A	I, II, III, IV

<u>NAME AND ADDRESS</u>	<u>PHONE/DG</u>	<u>MODULE(S) ATTENDING</u>
LARRY SANSON USDA Forest Service, R-3 Lincoln N.F. Federal Building 1101 New York Avenue Alamogordo, NM 88310	505-437-6030 DG: R03F08A	IV
JOHN SCHMECHEL USDA Forest Service, R-5 Stanislaus N.F. Groveland R.D. 24545 Old Highway 120 Groveland, CA 95321	209-962-7825 DG: R05F16D54A	I, II, III, IV
JOE SHERLOCK USDA Forest Service, R-5 Stanislaus N.F. MiWok R.D. P.O. Box 100 Mi-Wuk Village, CA 95346	209-586-3234 DG: R05F16D51A	II, III, IV
PAT SKYLER USDA Forest Service, WO Forest Pest Management 2121C Second Street Davis, CA 95617	916-758-4600	I, II, III, IV
STANLEY L. SMITH U.S. Fish & Wildlife Service 4101 East 80th Street Bloomington, MN 55425	612-725-3548	III, IV
TOM SMITH North Carolina Division of Forest Resources Rt. 8, Box 380 Goldsboro, NC 27530	919-731-7988	I, II, III
GLENN TAYLOR Shenandoah National Park Rt. 4, Box 348 Luray, VA 22835	703-999-3496	I, II, III, IV
HAROLD THISTLE USDA Forest Service MTDC Ft. Missoula, Bldg. #1 Missoula, MT 59801	406-329-3981 DG: R01A	I, II, III, IV
J. KEITH WATSON Shenandoah National Park Rt. 4, Box 348 Luray, VA 22835	703-999-3496	I, II, III

<u>NAME AND ADDRESS</u>	<u>PHONE/DG</u>	<u>MODULE(S) ATTENDING</u>
JAY R. WEST DOI, Bureau of Indian Affairs 331 South Second Avenue Minneapolis, MN 55401	612-373-1147	
BOB WHITE USDA Forest Service, R-9 Alegaheny N.F. 222 Liberty Street Box 847 Warren, PA 16365	814-723-5150 DG: R09F19A	I, II, III, IV

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Note: Module I - Insecticide  
 Module II - ICS  
 Module III - Common Subject  
 Module IV - Herbicide



## Correspondence

**100 and Beyond**  
 Longer distances  
 EVs become more  
 Efficient  
 More  
 EVs

### Term 100

Defined as a path length of 100 km.  
 Used to demonstrate the  
 efficiency of electric vehicles  
 as a potential alternative  
 to conventional internal  
 combustion engines.  
 Refers to the approach of  
 calculating the energy required

to travel

from one location to another  
 for different types of vehicles.  
 A comparison of the energy  
 used per kilometer traveled  
 for different types of vehicles  
 including conventional vehicles.

Can compare fuel economy of different  
 vehicles based on their  
 weight and driving patterns.  
 Can also compare the cost of  
 operating different types of vehicles  
 based on fuel consumption.

Can compare the cost of  
 operating different types of vehicles  
 based on fuel consumption.  
 Can also compare the  
 driving patterns through testing on a  
 road or a track to determine which  
 vehicle is more fuel efficient.





# NEW ZEALAND FOREST RESEARCH INSTITUTE

Private Bag 3020, Rotorua, New Zealand  
Telephone : +64 7 347 5899  
Facsimile : +64 7 347 9380

File PPC 4

27 April 1994

Dr Jack Barry  
USDA Forest Service  
2121C Second Street  
Davis, California  
95616  
USA

Dear Jack

Below is a submission from John Ray and myself outlining our thoughts on the National Pesticide Use Management Course at NARTC in Marana. John Ray, with his experience of similar courses over the world (including Marana) and extensive teaching record on pesticide use management in New Zealand, is in a particularly strong position to evaluate the merits of the facility at Marana. Although I have not been to Marana, I have seen the course material and have enough knowledge of its location to appreciate why it is a unique facility. We hope that our support will help to ensure the continuance of the National Pesticide Use Management Course at Marana.

## NEED FOR MARANA COURSE

Forestry is a vital resource that provides for wood production, recreation, and scenic values. In different parts of the world, the major forest management goals often differ. For example, in the plantation forests of New Zealand, efficient wood production is the primary concern, whereas in many forests in the USA, wood production must be balanced with recreational and scenic objectives. However, whatever the primary goals, the job of the forest manager is becoming more complex with increasingly stringent, often conflicting, environmental, ecosystem management, and economic constraints.

One complex and sometimes controversial aspect of forest management is the use of chemical and biological pesticides. With careful use, pesticides are powerful tools that help to maintain forest health and, where wood production is the primary concern, maximise crop growth rates. Herbicides are important for managing exotic and non-crop vegetation (e.g. competition reduction) and their judicious use can ensure high survival and growth rates of young trees; insecticides and fungicides protect the forest from insects and pathogens that are often unintentionally introduced into the ecosystems. With today's economic and environmental accountability, it is essential that pesticides are used responsibly and sensitively. Any use of these substances which causes an adverse ecological effect will only increase pressure to ban the use of pesticides. Proper use of pesticides can only be guaranteed through training to a high standard of all people involved with pesticide use, from managers through to the applicators. To achieve this, a cadre of highly trained personnel are required worldwide to ensure that minimum standards are met.

Such a group of dedicated and highly trained people will only become available if world recognised training centre exists. The National Pesticide Use Management Course at the National Advanced Resource Technology Center (NARTC) at Marana fills this role. It attracts participants and internationally recognised instructors from around the world. The breadth of experience contributed by both students and instructors from many countries broadens understanding of the diverse problems of pesticide use.

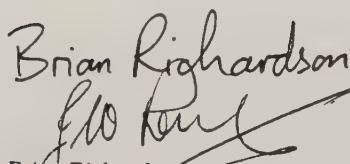
Marana is an ideal site. It has excellent facilities, with accommodation, food and lecture rooms all provided. One of the many positive aspects of Marana is the idea interchange and discussion brought about by the accommodation of all participants on site. Its climate is ideal and almost guarantees that outdoor practical sessions can progress as scheduled. This is an extremely important point because any course of this nature requires a high percentage of time getting "hands-on" experience with spray equipment, its calibration and use. This can only be achieved if large areas are available for the students to work i.e. usually outside, and the unpredictable climates of many areas can make the running of similar courses very traumatic in the event of rain.

Marana has the added advantage, in that it has an airfield on site. This is the envy of trainers such as myself who can only describe aircraft equipment, calibration etc. because we do not have access to such facilities. As a result, the course we run in New Zealand compares poorly with that at NARTC. The existing course covers all aspects of pesticide use - chemical selection, biology of the pest, selection of application equipment, a thorough understanding of meteorological effects, ecological effects, how to monitor the fate of the chemical in the environment, and public relations. This depth is an essential ingredient to the success of the course.

For many years, prestigious pesticide application courses were run in England at Cranfield Institute of Technology that were attended by pesticide application planners managers and applicators drawn from countries worldwide. The course I attended had students from 25 different countries and instructors from a similar number of sources. Cranfield was similar to Marana in many ways; good accommodation and lecture facilities, and an airfield, but did not have the predictable weather experienced in Arizona. With the demise of the Cranfield course there is the opportunity to develop the course at NARTC to take over this role. Although it has probably already achieved this to a limited extent, more publicity worldwide would certainly increase both its profile and demand for enrolments from the international community. We would welcome the opportunity to participate with you in planning future programs.

We strongly support the continuance and development of training in pesticide use at NARTC, and believe that at Marana the Forest Service has a unique and enviable training centre.

Yours sincerely

A handwritten signature in black ink, appearing to read "Brian Richardson" above "John Ray". The signature is fluid and cursive.

Brian Richardson and John Ray  
Scientists  
NZ Forest Research Institute



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

77 WEST JACKSON BOULEVARD  
CHICAGO, IL 60604-3590

May 11 1994

REPLY TO THE ATTENTION OF:

SP-14J

Jack Barry  
United States Department of Agriculture  
Forest Service  
Washington Office  
2121 C Second Street  
Davis, California 95616

Dear Jack:

I would like to thank you and the U.S.D.A. Forest Service for inviting me to be on the faculty of the Pesticide Management course at Marana this year. Once again, I was impressed at the quality of instruction and material presented at the National Pesticide Use Management Training, and, in particular with the facilities at Marana. The location is perfect and the capability of the staff to produce high quality audio-visual materials was impressive.

I was also encouraged to see how the curriculum had evolved since my last attendance, as a student. It definitely has adapted to serve the needs of the Forest Service personnel involved with pesticide applications. As pesticide regulation changes and as the Forest Service pesticide policies change, the course has continued to adapt to the current needs of students. I think you have developed a system to respond to change. The Student evaluations were critical in revising the course, and the Faculty meeting in the Fall was important in refining the specifics of the two week session.

As I told the students, I find it invaluable to be able to meet and exchange ideas and information with other U.S. government workers, as well as those from abroad. The training center at Marana provides the ideal setting for this exchange. Distractions are kept to a minimum and the students can concentrate on the course material. For the faculty, the facility is ideal, providing all the necessities for preparation of their presentations.

If you wish, I would be glad to share with you my ideas for topics to include in future courses. As we all found out, there is so much information, it becomes difficult to select the most appropriate and timely subjects for the course. As public servants, we must recognize the public's concerns about pesticides. I feel strongly the course should be held again, and

incorporate the most up to date information about the scientific and regulatory aspects of pesticide usage.

Federal agencies must work together to make Federal dollars go farther and to enhance the activities of their respective organizations. Accomplishments become more meaningful when several organizations can look back and know they worked together on resolving difficulties and finding a solution. I hope we can look back in the future and say we have done our best to achieve true environmental protection by working with all involved agencies and interest groups.

Finally, I would like to say I have taken "home" a lot of information which I plan to share with others. I hope we can continue to exchange information in the future and work cooperatively toward the wise use of pesticides and a better environment.

Sincerely,

*Margaret*  
Margaret L. Jones  
Environmental Scientist



DEPARTMENT OF THE AIR FORCE  
AIR FORCE RESERVE



28 April 1994

FROM: 910 AG/DOS  
3976 KING GRAVES RD  
YNG-WRN RGL APRT  
ARS, VIENNA OH 44473-0910

TO: JOHN W BARRY  
FOREST SERVICE USDA  
2121 C SECOND ST  
DAVIS CA 95616

We really appreciated your including Doug and I in your excellent National Pesticide Use Management Course at NARTC, Marana AZ. You did a superb job of selecting your topics and instructors. I was particularly impressed that all the material presented was up-to-date. The environmental and public relations issues you are dealing with today typically are DoD problems for us, 1 to 2 years later. Just as important as the instruction was the diversity of expertise and agency representation in the students who attended the course.

Your facilities at the National Advanced Resource Technology Center are first class. The visual and audio aid equipment was all state-of-the-art. The support from the staff was outstanding. Since we teach the DoD Aerial Application of Pesticide Certification Course, we are particularly appreciative of the good year-round weather and the public isolation which facilitates outdoor training and flying exercises. In today's world it can be very difficult to obtain environmental or community approval for such activities.

We hope you will continue to offer this course at NARTC in the future. If you need instructor assistance, please let us know.

You may not be aware that the USDA is now sending students to our DoD course as prerequisite training for federal certification. As budgets get tighter the cooperative efforts you have supported since I have known you become increasingly important in maintaining quality programs in both USDA and DoD.

Thanks again for letting us participate in your course.

*Terry L Biery*  
TERRY L BIERY, Lt Col, USA2FR  
Research Entomologist



United States  
Department of  
Agriculture

Forest  
Service

Washington  
Office

2121 C Second Street  
Davis, CA 95616  
PH (916) 551-1715  
FAX (916) 757-8383

Reply To: 2150

Date: April 5, 1994

Subject: Instructor Volunteers - National  
Pesticide Use Management Course

To: John Roberts  
NARTC

*Reading fil*

Thanks to NARTC and the instructors we successfully completed the 4th national pesticides course at the Pinal Air Park facility. As in the past we were fortunate to enlist (on a volunteer basis) several internationally known instructors to support this course. The volunteers allowed us to present a level of training that otherwise we could not have afforded, given consulting fees of \$500 to \$1,200 per day. As with past courses we agreed to cover the volunteers reasonable expenses, basically their travel, per diem for the Tucson area, and miscellaneous expenses. I believe this can best be handled through a purchase order. Again I would like to emphasize that we were most fortunate to again have volunteers of international stature to support this training.

*John W. Barry*  
JOHN W. BARRY  
Chair, Steering Committee





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United States Department of Agriculture	Forest Service	Washington Office	2121 C Second Street Davis, CA 95616 PH (916) 551-1715 FAX (916) 757-8383
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Reply To: 2150

Date: April 18, 1994

Subject: Award rationale

To: Jesus Cota

The purpose of this rationale is to explore justifications to recognize and award the four module leaders who helped to organize and present the fourth national pesticide course at NARTC (Marana, AZ), March 16-30, 1994. You asked whether an award might be appropriate, thus this response.

Each of the pesticide courses developed by WO/FPM/PUM&C has been in response to national needs expressed by Regions and Area for pesticide use management training. The fourth course was recommended by the course steering committee endorsed by the national FPM Directors, and approved by the Director, WO/FPM. In organizing the course we had to overcome several obstacles that appeared for a while to have the potential of dooming the course. The primary problems, common to representatives from all Regions and Area, related to budget, staffing, and travel reductions. It appeared that we had few viable options on how to develop and present a course that met our high standards and do so under a low budget. There were those who wanted to cancel the course and others who predicted that we would not have enough students. To counter these problems we decided to conduct the course in modules, allowing students to take only those they could afford, given restraints of time and per diem. Short modules, the committee reasoned, would also reduce instructor time on site; therefore reducing costs.

I provide this background primarily to point out the difficult task that challenged the steering committee module leaders. They had to overcome their own doubts, seek support from their units, identify and enlist instructors, and operate within a confined budget. In the process one module leader dropped out in mid-stream, necessitating a quick search for a substitute. Two of the module leaders had not previously served as unit or module leaders, nevertheless they pitched-in and delivered. I believe the module leaders delivered an excellent course given this difficult task.

I recommend an award be given to each of the following module leaders:

Julie Weatherby - Insecticide Module

Jim Hadfield - ICS Module

Jim D. Brown - Common Module

Ed Monning - Herbicide Module

/s/ John W. Barry

JOHN W. BARRY  
Chair, Steering Committee

## Appendix J

### Invitation to Russia





United States  
Department of  
Agriculture

Forest  
Service

Washington  
Office

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Reply To: 3400/1550

Date: Draft

Dear :

The United States Department of Agriculture, Forest Service is pleased to extend Russia an invitation to participate in the National Pesticide Use Management Course by sending two representatives. The course will be held at Pinal Air Park, Marana, Arizona, 16 March - 30 March 1994. In addition to the two-week course I propose that your representatives allocate an additional week after the course to visit other areas or activities. Options include forest health activities in a selected national park or national forest, an aerial spray project for control of gypsy moth, or other activities of interest. The additional week tour would be arranged based upon the interest of your representatives.

The goal of the National Pesticide Use Management Course is to provide a forum for pesticide-use management information and technology transfer to USDA Forest Service scientists, foresters, State and Federal cooperators, and international partners.

The course will consist of lectures, panel discussions, demonstrations, a field trip, group exercises, and individual "hands-on" exercises. The course will be conducted in four units or modules with objectives as outlined below:

Module I - Insecticide

To review and provide students updates on use, types, and developments in forestry use pesticides.

Module II - Incident Command System (ICS)

To introduce students to the ICS system - how to plan, organize, manage, and direct pesticide application projects using ICS. ICS is an organizational system for responding to natural disasters such as forest fires, insect infestations, floods, and earthquakes.

Module III - Common Subject

To update students on national and international issues on pesticide use and practices to include environmental protection, human health, pesticide equipment, forest health, and ecosystem.

Module IV - Herbicide

To review herbicide use, availability, policy, and practices on national forest and range lands.

There will be an opportunity during the course for our foreign students to participate in a foreign forestry panel discussion. The intent of the panel is for the course students to hear firsthand about the use of forestry pesticides in other countries.

There is no tuition costs for this course. Costs of air travel, meals, and lodging must be provided by Russia. Marana is located approximately 30 miles east of Tucson, Arizona, and Tucson is served by a major airport. Students will take lodging at the Best Western Inn Suites Motel, 6201 North Oracle Boulevard, Tucson, Arizona, telephone (602) 297-8111.

I would appreciate your reply before 30 January 1994 and an indication of your tour interests following the course.

JAMES C. SPACE  
Deputy Associate Chief

## Appendix K

### Tee Jet Spray Products On-Site Training



## S P R A Y I N G S O L U T I O N S

Drift and drift management seem to be the biggest issues of the day. Manufacturers of sprayers and sprayer components, especially nozzles, are working to develop products that improve the applicators ability to manage applications. There is an ever widening variety of technology emerging that is difficult keep track of.

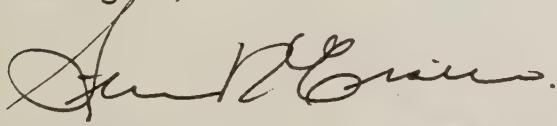
If you have a training schedule, or if you offer class room instruction or workshop opportunities, we can deliver a presentation that will include a live demonstration of this new technology at work. We can customize a presentation in terms of length or focus depending on the type of workshop you need.

In the past, we have worked with a variety of colleges and universities, and we focus on the technology and the process, not the product. We have provided classroom demonstrations, participated in after hours meetings, and have done workshop type presentations, the forum would be your choice. We can expand the program to include a vast array of technical information about atomization, how droplets are formed, and how droplet size is measured. We can focus on specific types of applications or work specifically on calibration and nozzle selection information. One of the key topics covered is how to develop a successful drift management program based on the latest available technology.

We can help everyone understand the differences between "Air Aspirating", "Air Atomizing", and "Air Assisted" spray systems. We will explain "pre-orifice" and "turbulence chamber" and show how these effect spray nozzle performance. We can discuss and demonstrate nozzles and calibration for banding applications.

As always these presentations are provided at no charge and the literature provided is also free. Improved understanding of spray nozzle technology will promote application accuracy and efficacy. That will in turn save time, money, chemicals, and energy.

Let us know how we can help. Call us now to discuss scheduling for fall and winter programs.  
Best regards,



Steve Eisele



**TeeJet® WEST**

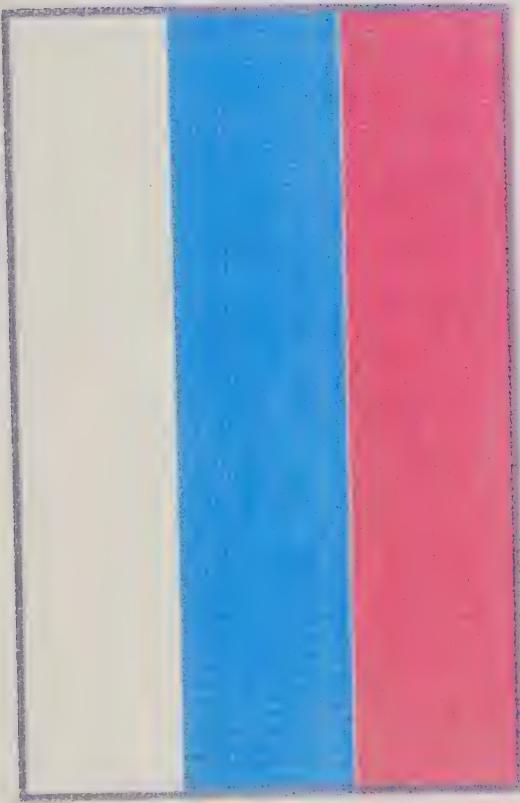


## Appendix L

### A Visit From Russia



# **Federal Forest Service of Russia**

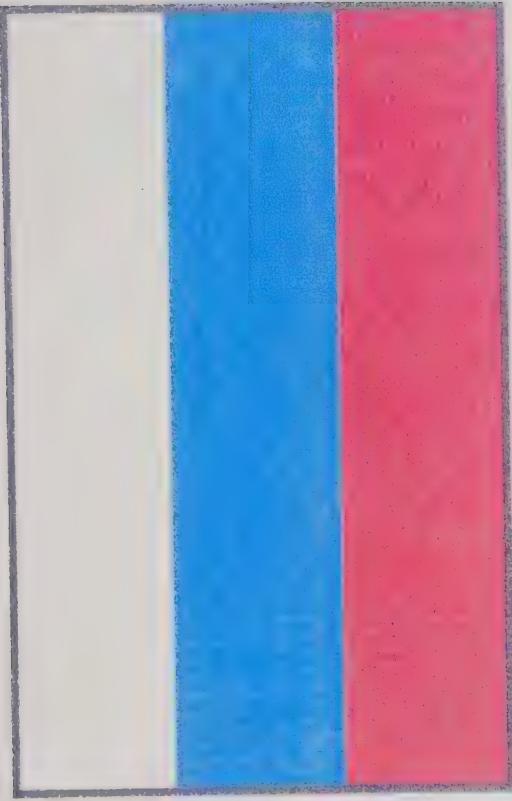


**Andrey P. Raspopov**

*Main Technologist,  
Department of Forestry  
Protection*



# Moscow State Forestry University



**Dr. Elena G. Kulikova**

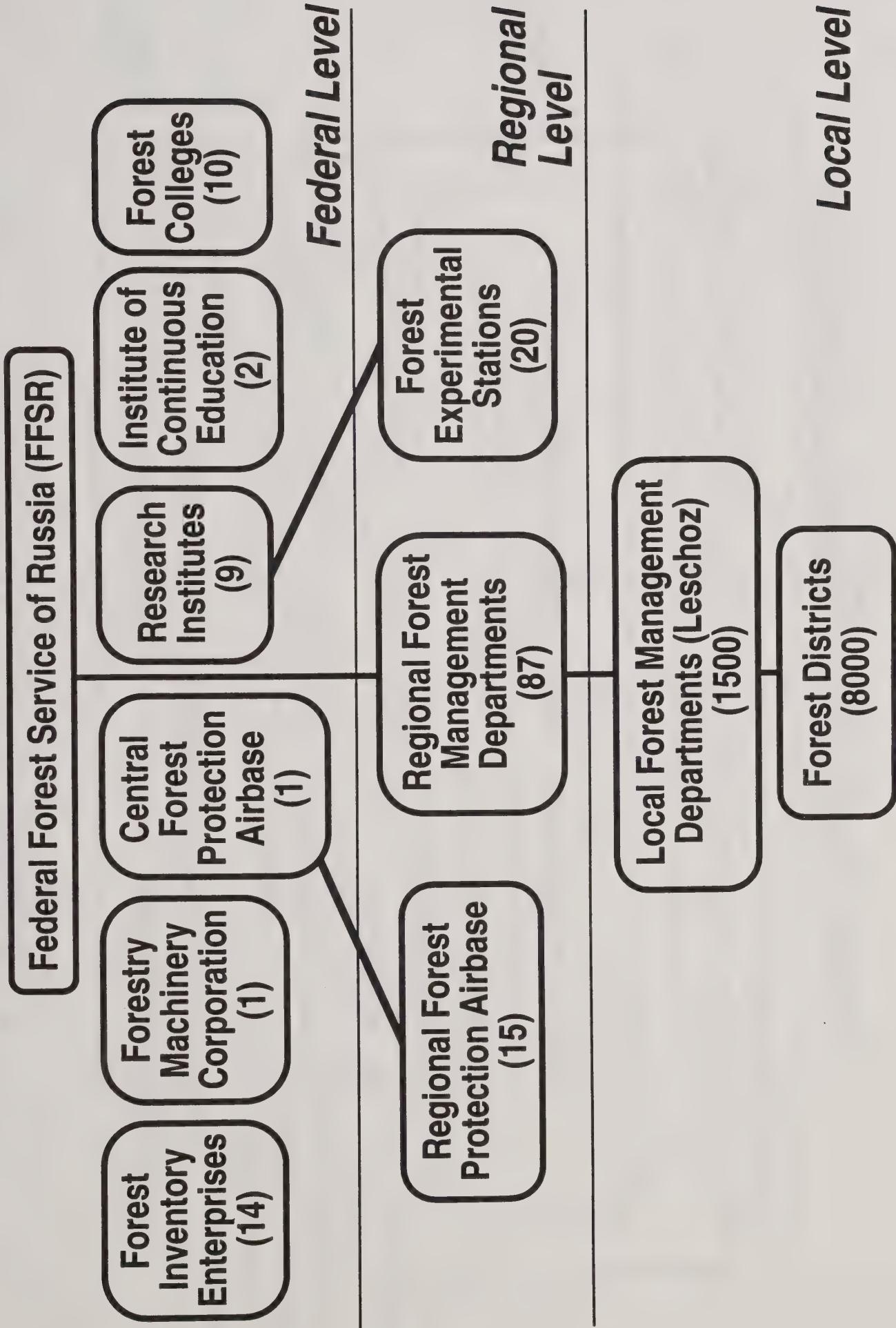
*Associate Professor of the  
Department of Ecology and  
Forest Protection, Candidate of  
Biological Sciences*



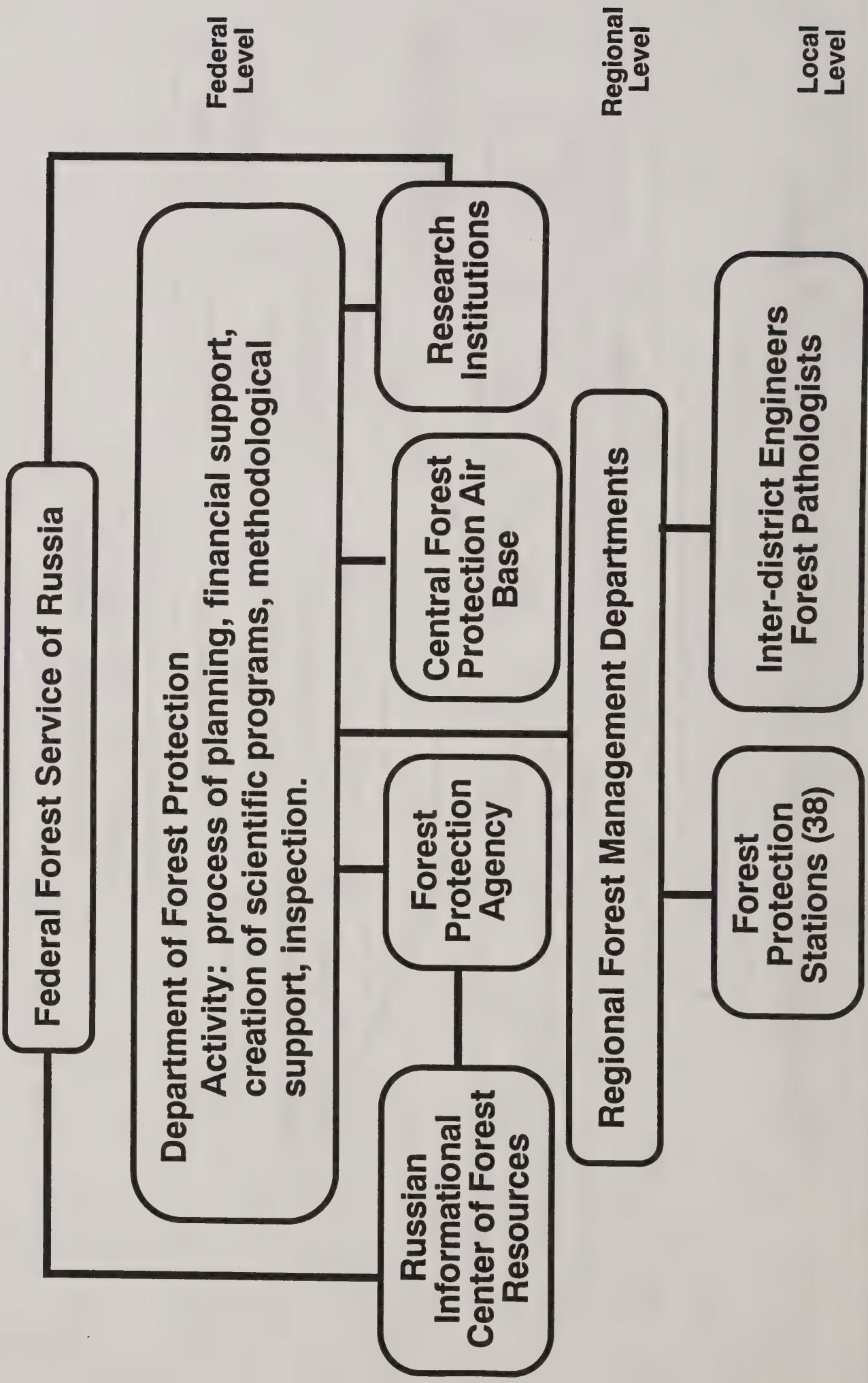




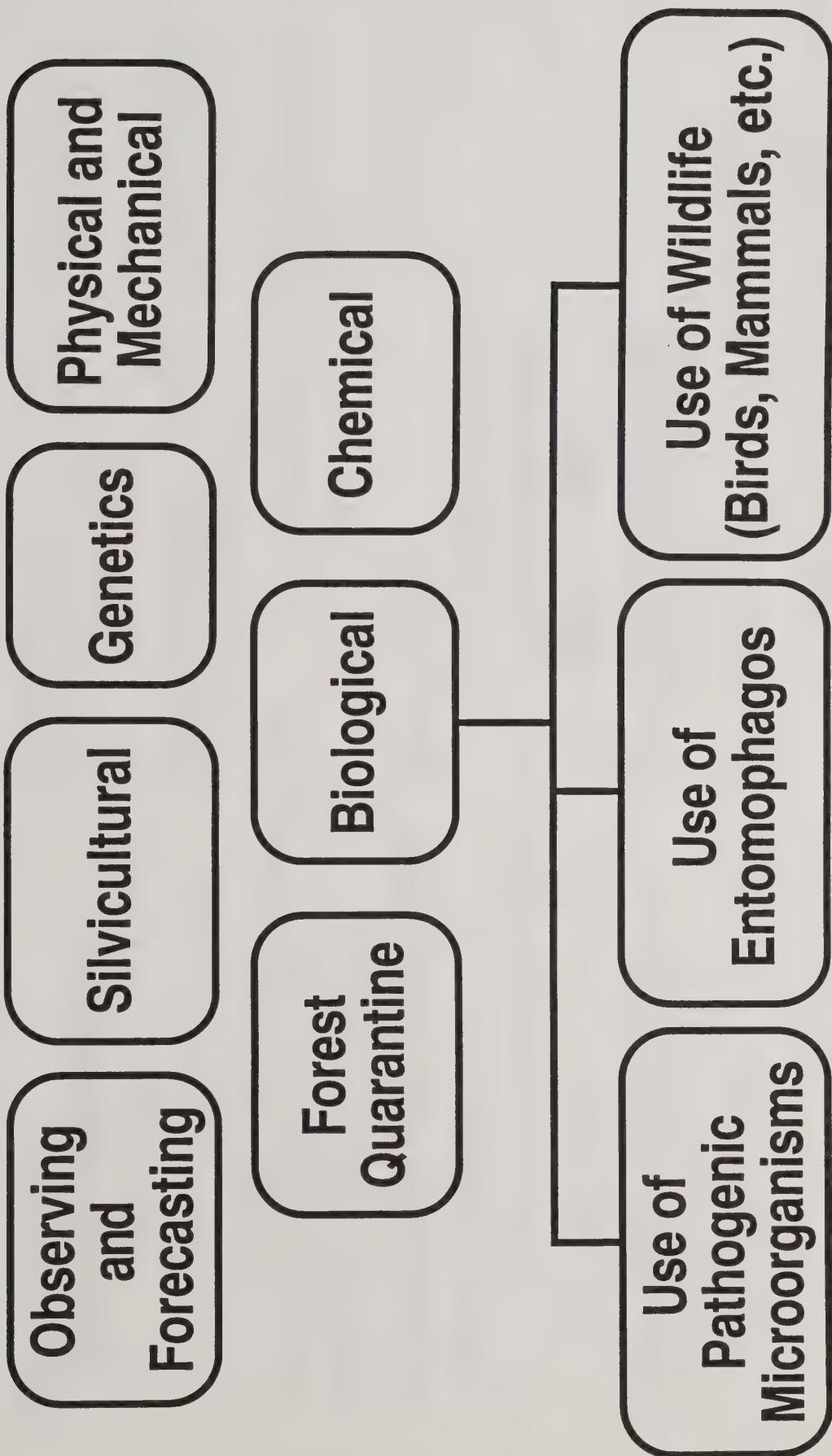
# Management Levels of Forest Service in Russia



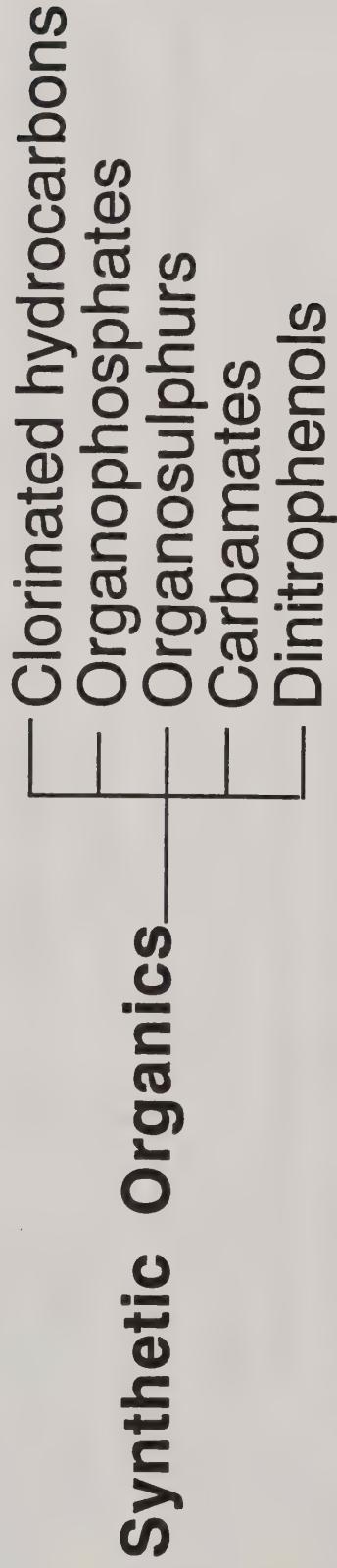
# Forest Protection Service Structure



# **Methods of Forest Protection**



# **Classification of Insecticides**



**Botanicals**

**Synthetic Pirethroids**

**Inorganic**

**Insect Growth Regulators**



**Insect repellants**

**Pheromones**

**Chemosterilants**

# List of Main Dangerous Pests ... Insects

<u>Defoliators</u>	<u>Bark Beetles</u>	<u>Root Feeders</u>	<u>Sapsuckers</u>	<u>Bud and Twig Borers</u>
Complex of Budworms (Tortricidae)	Dendroctonus micans	Melolonthinae (g.g. Melolontha, Amphymallon etc.)	Pine Spittlebug (Aradus cinnamomeus)	Shoot and Tip Mothes (g. Rhyncionia)
Complex of Pine Sawflies (Tenthredinidae)				Complex of Pine Weevil (Hylobius, Pissodes)
Gypsy Moth (Lymantria dispar)				
Lymantria monacha				
Siberian Silk Moth (Dendrolimus sibiricus)				
Pine Silk Moth (Dendrolimus pini)				
Euproctis chrysorrhoea				
Bupalus pinarius				
Pannolis fammea				

# **List of Main Dangerous Pests ... Diseases**

## **Damping - off**

(*Fusarium*, *Althernaria*, *Botrytis* etc.)

## **Needle Cast**

(*Lophodermium sediticosum*, *L. pini*,  
*Phacidium infestans*)

## **Rusts**

(g. *Cronartium*)

## **Dutch Elm Disease**

## **Decays**

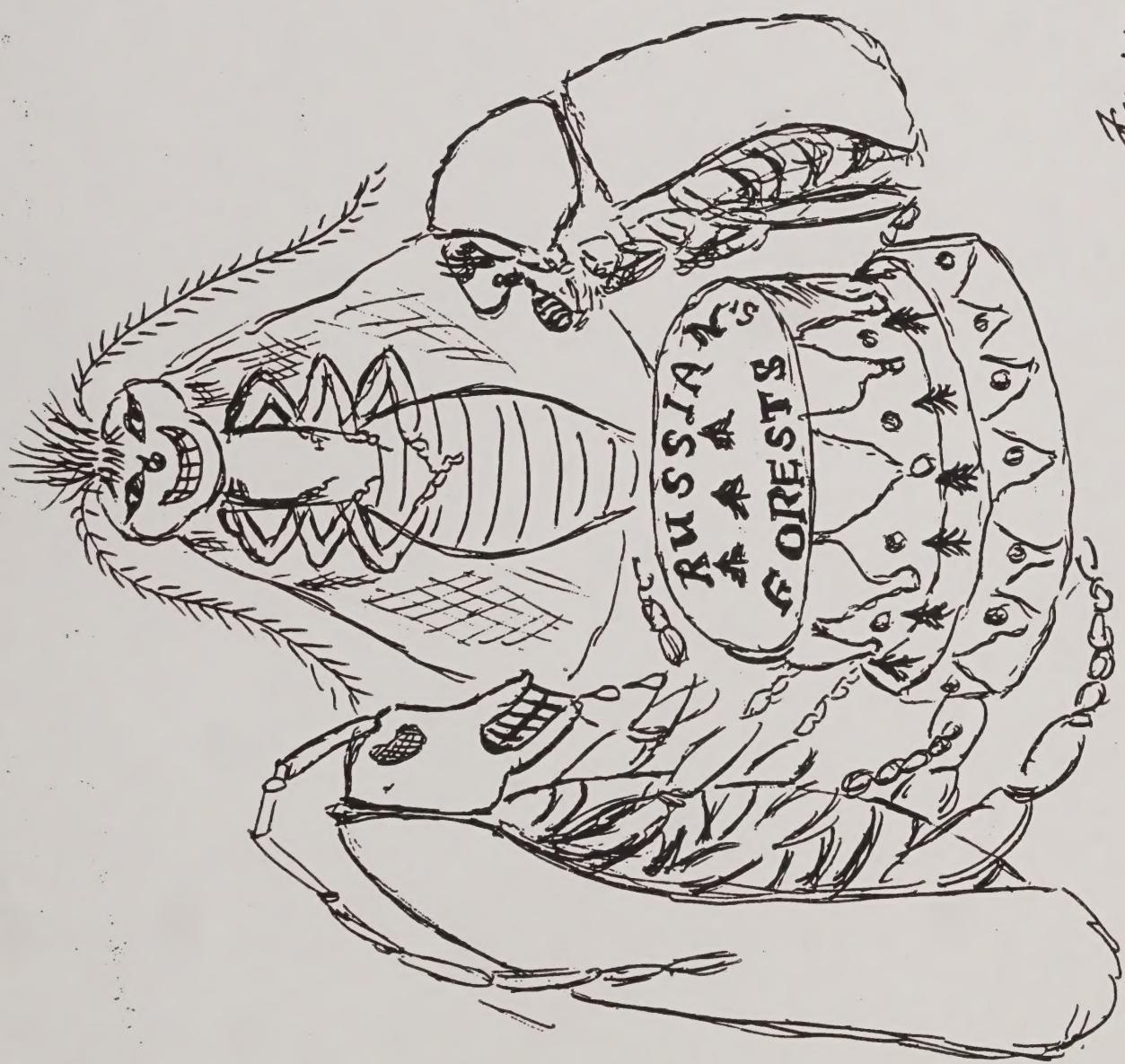
### ***Annosus root rot***

(*Heterobasidion annosum*)

### ***Shoestring root rot***

(*Armillariella mellea*)

Sydney -





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